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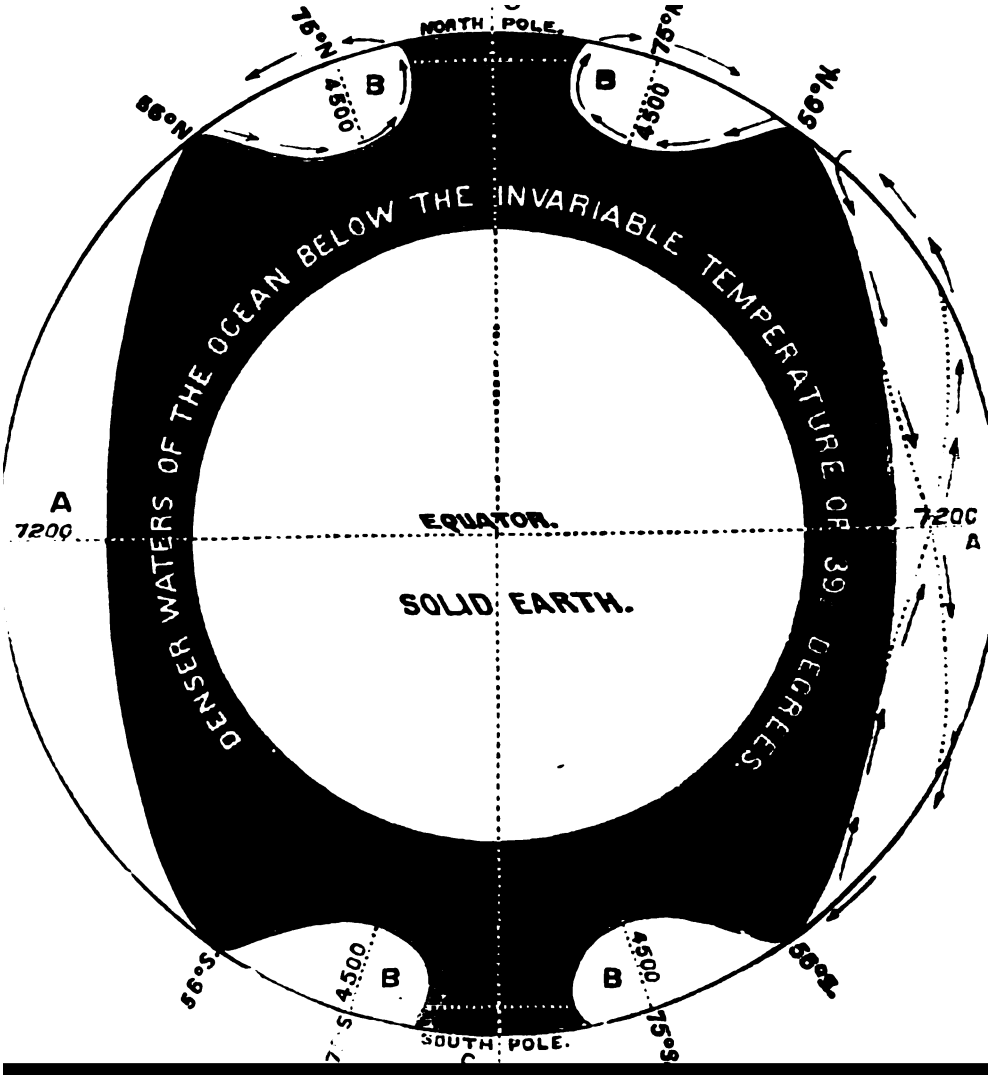

Transactions of the Illinois State Agricultural Society, with reports from county and district agricultural societies

Illinois State Agricultural Society

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TRANSACTIONS

OF THE

ILLINOIS STATE AGRICULTURAL SOCIETY,

WITH REPORTS FROM

COUNTY AGRICULTURAL SOCIETIES,

AND

KINDRED ASSOCIATIONS.

EDITED BY JOHN P. REYNOLDS, CORRESPONDING SECRETARY.

VOLUME V.—1861-'64.

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JOINT RESOLUTION IN RELATION TO THE PRINTING OF THE REPORT OF THE STATE AGRICULTURAL SOCIETY.

Resolved by the Senate, the House of Representatives concurring herein, That ten thousand copies of the Transactions of the State Agricultural Society be printed, under the direction of said Society, as heretofore; that fifteen hundred copies be distributed by the Secretary of State to the members of the General Assembly, five hundred copies for the use of the State Library, and the remainder for the use of the State Agricultural Society, and for distribution to Agricultural, Mechanical and Horticultural Associations, and public libraries throughout the State.

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NOTICE.

The Fifth Volume of the Transactions of the Illinois State Agricultural Society is now presented. Following the precedent of former years, the matter contained in this should have formed two volumes, the 5th and 6th, of the regular biennial series. It will be remembered that the session of the General Assembly of this State, held in 1863, was brought to an unexpectedly early termination by the prorogation of His Excellency, Gov. Yates. It so happened that the joint resolution ordering the printing of the Society's Transactions for 1861–2, had passed but one House when the dissolution of that body occurred, and the printing was therefore necessarily postponed until ordered at the following biennial session.

Rather than incur for the State the increased cost of publishing two volumes it was thought best by the Executive Board to condense the matter of four years into a single volume. This rendered it necessary to change somewhat the whole plan of the volume. The entries (at the Fairs) not receiving premiums, but, when published, valuable as a permanent record of the competition in each case, have been omitted, as the size of the volume would otherwise have been increased a hundred pages. Some other matters of interest have been excluded, and what is very much to be regretted, several valuable papers by members of the State Natural History Society have failed to be inserted. Neither was there place for the proceedings of the State Horticultural Society, other than the papers and essays with the fruit lists presented at their annual meetings. These will be found full of practical suggestions of great utility.

The Reports from County Agricultural Societies, owing to the disturbed condition of the country during the entire period covered,

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were not regularly transmitted, nor were they in most instances, when received, as full and satisfactory as they might have been made. Such as were received are published, and will be found to contain many statements of facts interesting to all who care to mark the advance of agricultural enterprise in this State.

The papers by Prof. A. H. Worthen, State Geologist, though originally familiar letters on geology, prepared for the Journal of the Society, embody much practical elementary information, and will receive attention.

Professor Wilber's estimates of "our natural resources" will surprise those not familiar with the facts, and convey a far better idea than is prevalent of the wonderful storehouses prepared and filled by nature with valuable minerals for our use.

Except in the department most interesting and important to the farmer and orchardist, Natural History is not well represented in this volume. Insects, and their depredations, are quite fully treated of in the papers by Mr. Thomas and Mr. Walsh, practical entomologists.

In view of the rapid increase of the cotton crop in this State, and of its great profitableness compared with other field crops in the southern counties, the essays of Mr. Dunlap and Mr. Chase will be read by many, and afford much reliable information.

Professor Turner's paper, on the "cultivation of field crops and the preparation of soils," is one of the most valuable from his able pen, and embodies very fully the views upon which he practices.

The other prize essays, and the statements accompanying the entries for prizes on field crops will be found replete with valuable facts and suggestions.

We have been unable, for want of space, to include in this volume much information in regard to the exhibitions at the annual fairs, and particularly, reports of the press containing much that is deserving of record here.

The volume is submitted in the confidence that its careful peru-

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LIST OF MATTER.

Officers of the Illinois State Agricultural Society for 1861 to 1864, inclusive.
Constitution of the State Agricultural Society.
Joint Resolution of the General Assembly in regard to printing Transactions.
Law to encourage County Agricultural Societies.
Report of the Executive Committee for 1861 to 1864, inclusive.
Proceedings of the Executive Committee.
Awards of Premiums at the Fairs of 1861, 1863 and 1864.
Awards of Premiums by the Executive Committee, at the winter meetings in 1862, 1863, 1864 and 1865.
Reports of Committees at the Fairs of 1861, 1863 and 1864.
Statements of Exhibitors in relation to Field Crops, Orchards, Sugars and Sirups.
Reports of Committee on Farms, Orchards, Nurseries and Draining.
Report of the Executive Committee on the field trial of Harvesting Implements and Machinery, at Dixon, in 1862.
Report of the Awarding Committee on the field trial of Plows and other Implements of Culture, at Decatur, in 1863.
Reports from County Agricultural Societies, for 1861, 1862, 1863 and 1864.
Premium Essays—
On Cultivation of Field Crops and Preparation of Soils; by Prof. J. B. Turner.
On Insects Injurious to Vegetation; by Cyrus Thomas, Esq.
On Insects Injurious to Vegetation; by B. D. Walsh, M. A.
On Culture of Cotton in Illinois; by M. L. Dunlap, Esq.
On Culture of Cotton in Illinois; by C. Thurston Chase, Esq.
On Practical Farming in Illinois; by C. W. Murtfeldt, Esq.
On Orchards in Illinois; by J. T. Little, Esq.
On Orchards in Illinois; by W. C. Flagg, Esq.
On Market Gardening; by Dr. H. Shroder.
On Land Drainage; by Henry M. Kidder, Esq.
On Imphee and Sorghum Culture, and Manufacture of Sugar and Sirup; by J. H. Smith, Esq.
On Chinese and African Sugar Cane, and Manufacture of Sugar and Sirup therefrom; by Dr. E. F. Newberry.
On Education of Farmers' Daughters; by Mrs. John R. Woods.
On Education of Farmers' Daughters; by Miss Mary E. Murtfeldt.
On the In-door Adornment of Home; by Miss Mary E. Murtfeldt.
On the In-door Adornment of Home; by Mrs. John R. Woods.

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On the Agricultural College; by RICHARD EDWARDS, L. L. D., President Normal University.

On Some of the Chemical Changes which take place in the Germination, Growth and Decay of Plants; by Prof. J. A. SEWALL, of the Normal University.

On Bread-making; by Mrs. JOHN R. WOODS.

Miscellaneous Papers—

Familiar Letters on Geology; by Prof. A. H. WORTHEN, Ill. State Geologist.

On Our Natural Resources; by Prof. C. D. WILBER, Sec'y Ill. State Nat. Hist. Society.

On The Culture and Management of Tobacco; by L. J. BRADFORD, Esq., President Ky. State Agricultural Society.

On Hemp Culture; by L. J. BRADFORD, Esq., President Ky. State Agricultural Society.

On Road-making on the Prairies; by H. L. BOIES, Esq.

On The Breeding, Rearing and General Management, &c., of Swine, by H. C. SMITH, Esq.

On Cellars; by Dr. L. S. PENNINGTON.

On the Fence Question; by "Wool-Grower," (S. P. BOARDMAN, Esq.)

On Manufactures and the Mechanic Arts in Illinois: by Dr. L. S. PENNINGTON.

On the Classification of Sheep for Prize Lists; by Dr. H. S. RANDALL.

On Market Gardening, with Statement; by S. W. ARNOLD, Esq.

On Orcharding, with Statement; by LUCIUS FRANCIS, Esq.

Selected Papers, Essays, Reports, Lists of Fruits, Useful and Ornamental Trees and Shrubs, recommended by the State Horticultural Society, from the Proceedings of 1861, '2 and '3.

Transactions of the State Horticultural Society, entire, for 1864.

Appendix—

Discourse on the Oceanic Avalanche and its Counter Currents, read before the Ill. Nat. Hist. Soc'y, June 24, 1862, by Prof. J. B. TURNER.

Proceedings of Conventions in regard to Agricultural College and Industrial University.

Report of Committee appointed by Farmers' Convention at Decatur, in 1864.

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ILLINOIS STATE AGRICULTURAL SOCIETY.

OFFICERS FOR 1861–'64.

EXECUTIVE COMMITTEE.

W. H. VAN EPPS, President.. .....Dixon.
LEWIS ELLSWORTH, Ex-President.....Naperville.

*C. B. DENIO, *Vice President*, 1*st District*.....Galena.
C. H. ROSENSTIEL, " 1*st* " .....Freeport.
A. J. MATTSON, " 2*d* " .....Prophetstown.
R. H. HOLDER, " 3*d* " .....Bloomington.
R. H. WHITING, " 4*th* " .....Galesburg.
J. W. SINGLETON, " 5*th* " .....Quincy.
A. B McCONNELL, " 6*th* " .....Springfield.
Wm. KILE, " 7*th* " .....Paris.
W. S. WAIT, " 8*th* " .....Greenville.
H. S. OZBURN " 9*th* " .....Pinckneyville.

BOARD OF COUNSELLORS.

JAS. N. BROWN, Ex-President.....Berlin.
H. C. JOHNS, " .....Decatur.
C. W. WEBSTER, " .....Salem.

Treasurer.....JOHN W. BUNN.....Springfield.
Recording Secretary.....JOHN COOK.....Springfield.
Corresponding Secretary.....JOHN P. REYNOLDS.....Springfield.

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CONSTITUTION

OF THE

ILLINOIS STATE AGRICULTURAL SOCIETY,

Revised and Adopted September 12th, 1860, by Delegates from the County Agricultural Societies in this State.

The name of this Society shall be "THE ILLINOIS STATE AGRICULTURAL SOCIETY." Its objects shall be the promotion of Agriculture, Horticulture, Manufactures, Mechanic and Household Arts.

SECTION 1. The Society shall consist of such citizens of the State as shall pay to its Treasurer one dollar annually, also of honorary and corresponding members. The Presidents of County Agricultural Societies in this State, or delegates from each, shall, *ex-officio*, be members of this Society.

SEC. 2. The officers of the Society shall consist of a President, one Vice President—for and to reside in each congressional district—a Recording Secretary, a Corresponding Secretary, a Treasurer, and an Executive Committee—to consist of a President, Vice Presidents and one Ex-President, whose term of office last expired—of whom a majority shall constitute a quorum.

SEC. 3. The Recording Secretary shall keep the records of the Society. The Corresponding Secretary shall carry on the correspondence with other Societies and with individuals in the furtherance of the objects of the Society.

SEC. 4. The Treasurer shall keep the funds of the Society, and disburse them on the written order of the President or the Executive Committee, countersigned by the Recording Secretary. He shall make a report of receipts and expenditures at the biennial meeting.

SEC. 5. The Executive Committee shall take charge of and distribute and preserve all seeds, plants, books, models, &c., which may be transmitted to the Society, and shall have charge of all communications designed or calculated for publication, and so far as they may deem expedient, shall collect, arrange and publish the same in such manner and form as they shall deem best calculated to promote the objects of this Society. They may also establish such by-laws, rules and regulations as they may deem necessary for the government of the Society, provided the same do not conflict with this Constitution.

SEC 6. There shall be a biennial meeting of delegates, to be appointed by the

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A GENERAL ACT FOR THE INCORPORATION OF COUNTY AGRICULTURAL SOCIETIES.

SECTION 1. *Be it enacted by the People of the State of Illinois, represented in the General Assembly*, That an Agricultural Society may be formed in any county of the State, by the voluntary association of any number of legal voters of the same—not less than twenty—who may meet and organize for that purpose, under a constitution and by-laws of their own construction, which they may alter and amend at pleasure; the use and benefit of the same to be alike free to every citizen of the county who is disposed to associate with them under the constitution and by-laws so provided, and in accordance with this act, upon such terms as may be provided.

SEC. 2. Each county Society thus organized may thereupon be constituted a a body corporate and politic, under an appropriate name; which name, together with that of the President, Secretary and Treasurer, shall be recorded on the books of the county clerk of the county wherein said Society is located; whereupon said Society shall be deemed legally constituted, and under this name shall be capable of contracting and being contracted with, suing and being sued, pleading and being impleaded, in all courts of law and equity in this State; and in said county shall have power to sue for and collect all gratuitous subscriptions which are or may be made to such Society; and may have a common seal, which they may change at pleasure; and may, in their corporate name, acquire, by purchase or otherwise, and hold real estate, for the use and to promote the objects of the Society, not exceeding in quantity, at any time, five hundred acres.

SEC. 3. Any person who shall, without the permission of the officers of the corporation, enter within any inclosure which may be used by such corporation for an Agricultural or Mechanical Fair, and any person guilty of disorderly conduct, or such as may interrupt or be prejudicial to the interests of said Fair, show or exhibition, whether inside the inclosure for the same, or at any distance within two hundred yards of such inclosure, shall be liable to immediate arrest, and to the payment of five dollars to the association, to be recoverable at suit of said corporation, in action for debt, before any justice of the peace or other court in this State.

SEC. 4. The provisions of the third section of this act are hereby made applicable and legally available to all Agricultural Societies within the State, whether incorporated or unincorporated, and which desire to take the benefit of the same.

SEC. 5. This act to be in force from and after its passage.

APPROVED February 8, 1857.

AN ACT TO PREVENT THE SALE OF SPIRITUOUS LIQUORS AND OTHER ARTICLES OF TRAFFIC AT OR NEAR AGRICULTURAL FAIR GROUNDS.

SECTION 1. *Be it enacted by the People of the State of Illinois, represented in the General Assembly*, That no person shall keep any shop, booth, tent, wagon or other carriage, vessel or boat, for the sale of spirituous or other liquors, or any provisions, or any article of traffic whatever, or sell, or expose to sale, give, barter, or otherwise dispose of, in or near any such shop, booth, tent, wagon or other carriage, vessel or boat, or in any other way or place, any spirituous or other liquors, or any provisions, or any article of traffic whatever, at or within the distance of two miles from the place where any Agricultural, Horticultural or Mechanical Society, or people are collected, holding any Agricultural, Horticultural or Mechanical fair or public exhibition; nor shall any person, within the distance aforesaid, exhibit any shows or plays, unless the same shall have been duly authorized by the proper authority, previous to the commencement of such exhibition; nor shall any person, within the distance aforesaid, promote, aid or be engaged in any racing of animals, or in any gaming of any description; nor shall any person obstruct the free passage of any highway or traveled road with-

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in the distance aforesaid: *Provided*, that nothing in this act shall affect tavern keepers, distillers or others, exercising their calling at their usual, legitimate places of doing business, nor any person who shall have a written permit from the President of such Agricultural, Mechanical or Horticultural Society to sell bread or other provisions for the supply of persons attending such Fair or exhibition, their horses or cattle, such persons conforming to all regulations of said Society and the laws of the State.

SEC. 2. That any person who shall be guilty of a breach of this act shall be notified by any one of the officers hereby authorised to make an arrest or seizure, or by any person, that he, she or they are violating the law, and if after such notice any such person shall continue in such violation, he, she or they shall forfeit and pay for every such offense any sum not less than five nor more than fifty dollars to the Society holding such Fair or exhibition, to be recovered before any justice of the peace or court having jurisdiction of the prosecution; and any judge of the circuit or county court, sheriff, coroner, justice of the peace, or constable of the proper county, shall, upon view or information, and without warrant, apprehend any person so offending, and seize booth, tent, wagon or other carriage, vessel or boat, spirituous or other liquors and other articles of traffic, and convey the same to a place of safe keeping, and take the said persons before any convenient justice of the peace having jurisdiction, together with an inventory of the things so seized; and the justice of the peace, upon complaint or oath, or affirmation of any competent witness, shall issue his warrants, which the said officer or constable shall have authority to serve, and cause the said offender to be arrested, and proceed forthwith to inquire into the truth of the accusation, and if found true, shall enforce the penalty of this act.

SEC. 3. If the accused shall fail to pay such fine as said justice of the peace shall inflict, together with all costs of proceedings, including the necessary expense of such seizure, the said justice of the peace shall forthwith issue an execution, commanding any constable of the county in which such inquiry shall be had to make the said fine, costs, necessary expenses and costs of execution, by sale of so much of the things so seized, and of so much of the other property of the accused as shall be necessary therefor and to make return thereof in ten days thereafter, and the overplus of the things so seized as aforesaid, after the satisfaction of said execution, shall be delivered to the defendant, on demand.

SEC. 4. In case the officer to whom said execution shall be delivered shall be unable to find sufficient property of such defendant to satisfy such execution, such Agricultural or other Society, upon affidavit of any of its officers, shall be entitled to a *ca. sa.* against the body of the defendant, as in other cases. The defendant in any suit under this act shall have the right of trial by jury, as in other cases under the laws of this State.

SEC. 5. This act is hereby declared a public act.

APPROVED February 13, 1857.

AN ACT TO REVIVE AND CONTINUE IN FORCE AN ACT ENTITLED "AN ACT TO AID AND ENCOURAGE COUNTY AGRICULTURAL SOCIETIES."

SECTION 1. *Be it enacted by the People of the State of Illinois, represented in the General Assembly*, That the act entitled "An act to aid and encourage County Agricultural Societies," approved February 18th, 1857, be revived and continued in force, from and after the first day of June next until otherwise provided by law; and that the sum of one hundred dollars be annually paid by the Treasurer of the State to the Treasurer or Fiscal Agent of each County Agricultural Society in the State, as therein directed.

SEC. 2. This act shall take effect and be in force from and after its passage.

APPROVED February 18, 1861.

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TRANSACTIONS.

REPORT OF THE EXECUTIVE COMMITTEE,

FOR 1861, 1862, 1863 AND 1864.

To the Governor and General Assembly
of the State of Illinois:

Conforming to an established custom, the Executive Board of the Illinois State Agricultural Society respectfully submit the following brief review of the condition of the industry of the State, and of the operations of the organization they have the honor to represent, for the four years last past.

The period covered by this report has been the most eventful in the history of the State and the nation. Our labors as officers of the society commenced just at the dawn of the great rebellion in January 1861, were concluded some three months prior to the final capture or dispersion of the armed insurgent forces, and were therefore performed under an ever-present sense of threatened danger and disturbance to the interests it was made our special duty to guard.

As indicating our views of the best policy to be pursued by the agriculturists of the State, we quote the concluding paragraphs of an appeal which was widely disseminated with copies of the society's premium list in the early spring of 1861:

"One word more to the farmers of Illinois. Domestic troubles which, in the history of the world, have always been attended with neglect of agricultural pursuits, and generally followed by famine, seem to threaten us as a nation.

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"Upon the farmer and his labor must at last depend the production of the prime necessities of human life; and whether the present national disturbances shall be of long or short duration, your duty as tillers of the soil is plain.

"There is now, in one portion of the State, what, in times of quiet, would be regarded as a large surplus of breadstuffs, and in another portion the prospect is good for a heavy crop of wheat the coming harvest; but notwithstanding these things, unless the proper efforts are put forth and continued to save the surplus now in your granaries, and to sow and plant and produce still more, that surplus will soon disappear. Let us exhort you to till this year every productive acre of your soil. Let no excitement, no interest in the stirring events of the day interrupt the operations of the farm. You know not what a year may bring forth. Your market is certain, and all history is a lie if it shall not be remunerative.

"We urge you then to strain every nerve; your interest financially cannot fail to be promoted by it, while your country and the cause of humanity alike demand it."

The inventors and manufacturers were also assured by the same circular that "the Mechanical Department, Class F, had been entirely and throughout reconstructed, both as to the objects and to the amounts offered in premiums. The artisans of the State will find their wants and interests have been carefully consulted." In short, so far as the management of this society could effect it, the industry of the State was placed upon a war basis at the earliest possible moment after civil war became a verity, and throughout our entire term everything within the means at our command which could be done to stimulate production or economise labor has been done.

We have no cause to be dissatisfied with the results. From 1861 to 1864, inclusive, there were actually mustered into the various branches of the Federal military service, and credited to this State one hundred and ninety-eight thousand five hundred and eighteen (198,518) able-bodied men, and this out of an entire population in 1860, of one million seven hundred and nineteen thousand four hundred and ninety-six, (1, 719,496) or more than eleven per cent. of the whole. The muster rolls in the Adjutant General's office show that by far the largest number of these soldiers were drawn from the farms, and that the workshops of the State furnished almost all the remainder; this could hardly be otherwise in a State where, as in this, the industrial interests so largely prepon-

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derate over all others, and is mentioned in this connection simply to illustrate the extent to which our early apprehensions were realized, and that it may be held in remembrance while considering the following report of progress made during the same period in the several branches of industry referred to.

STATISTICS.

It would be far more satisfactory, and the conclusions arrived at would be far better assured, if we could verify them by facts and figures gathered from official and other sources. This can be done only through the operation of a law for the specific purpose of collecting them. There is no statutory provision at all adequate to insure the reliable performance of any part of the work ordinarily assigned to a bureau of statistics. Even the census, when taken by Federal or State authority, is not always a very close approximation to the truth, while the figures obtained in regard to other objects than population, by the officers charged with that duty, are many times full of errors, and, we think, never entirely to be relied on.*

Aside, however, from the want of that accuracy without which all pretended statistics are simply pernicious delusions, the range of subjects to which under existing laws the attention of census-takers and assessors is called, is so limited as to render the whole work, if even well performed, of little real value in itself, and chiefly to be esteemed because furnishing the most satisfactory evidence that a much more comprehensive system should at the earliest possible day be provided for. The cost of widening this range so as to embrace all proper subjects, would be insignificant compared with the enhanced value of the results to be obtained. Agriculture and the industries dependent upon, and closely allied to it, being so greatly the leading material interest of the people of this State, the condition and progress of every other interest must exert an appreciable influence upon the prosperity of that, and hence, to collect merely the statistics of Agricultural production can afford but a small part of the information required for the successful and intelligent prosecution of the business of farming. Not this alone, however: every farmer is a citizen and bound to all the elements of society by ties

*[Our friends in Bureau county (Lat. 41° 30′) will be surprised to find by U. S. Census Report for 1860, they are credited with four (400) hundred bales of ginned cotton, of 400 lbs to the bale, produced that year. Jasper county is credited in same Report with 430 bales of ginned cotton, produced in that year.]

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and relations as strong and multiform as those which bind citizens pursuing any other avocation; and hence is, and should be, as deeply concerned as they in all the movements of society. In respectfully urging this subject upon the attention of your Excellency and of the General Assembly, we do not, therefore, speak simply in behalf of a class or a portion of the people, but of all who affect or are affected by *society in movement.*

The Hon. E. D. Mansfield, Commissioner of Statistics for Ohio, in his first annual report, in 1857, thus ably presents this subject in replying to the question "*what is statistical science?*" "The science of statistics is a branch of what may be termed SOCIAL SCIENCE. This social science has been gradually growing up, especially in Europe, just in proportion as liberal institutions advanced, as the people became enlightened, and governments cared for the people. It is not written out in any formal treatise, like mathematics, mechanics or astronomy, but exists in detached fragments in a yet unformed state. This has been the case with all science, till each separate fact and principle has been discovered in sufficient numbers to constitute general laws and systems. Then they become embodied in elementary treatises and take place among the branches of fixed knowledge. Social science is no more doubtful or confused than chemistry was a century since. Yet chemistry is now an established and beautiful science; and so will the laws of society become in another generation. Of this social science STATISTICS is the real basis. Its object is to ascertain both the facts and the laws of social movement. Its inquiries extend to the physical laws of man as a social being; to the resources of the country in which he lives; to the growth of society; to its labor and production; to its commerce, manufactures, and arts; to its property and wealth; to crime, poverty and mortality; to education and religion; and in fine, to all those facts of condition which may increase or diminish the strength, growth or happiness of a people. With an extent so broad, and objects so useful, statistics are raised to a dignity even higher than that of those fixed sciences whose beauty and utility have so long been the objects of admiration to mankind; for the laws which govern his own condition and happiness must be of higher importance to man than a knowledge of those, however useful, which no effort of his can change.

"The high value of statistics, as an element of government, has in the last half century come to be understood and fully apprecia-

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ted by the most enlightened States of Europe, and especially by the scientific men of those countries. * * * *

Heretofore statisticians, have been chiefly, like the geologists, and a short time since, the chemists, engaged in ascertaining the facts of their science rather than the general and universal laws which govern it.

The SCIENCE of statistics, like the mechanics of the natural world, embraces two systems of principles: 1, The principles of man and society as a fixed existence, simply as beings; 2, The principles of man and society in movement. All the elements of the physical man, and the natural relations of age, sex, aliment and disease, belong to the first system; and in the present state of society may safely be left to men of science pursuing their own inquries in their own mode. All the principles which relate to growth, industry, production, culture, art, commerce, education, religion, invention and vitality, belong to the second system, or SOCIETY IN MOVEMENT. It is the last which most interests the people. The principles which govern the movement of society can only be deduced by ascertaining all the elements of society at *successive periods of time.* In other words the *precise state of facts* at precise periods must be ascertained. The relation which this state of facts in one period bears to the state of facts in another period in any one line of movement, is the relative measure of that movement, and when all the movements of population, art, education, property, religion, vitality, crime and pauperism have been ascertained, at different periods, it will be seen at once how they have influenced each other—how they have been influenced by natural causes, and what legislation has proved injurious or beneficial.

These facts are the immediate objects of statistical inquiries, and this science the ultimate end to which they lead."

Ohio and some other of our sister States have been wiser in this regard than we; and they are now in possession of annual photographs of the enumerated elements of society, which are priceless in their immediate and historic interest and value. If we possessed such pictures with the series extending no farther into the past than to the commencement of the late civil war, simply showing the movement of society in this State from 1860 to the present time, every reflecting citizen would esteem them as he would household portraits, enhancing in value with the lapse of each succeeding year. For the reasons thus briefly adver-

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ted to we respectfully and earnestly ask that the whole subject may receive at the hands of the General Assembly that careful consideration to which its importance to the people of this State so justly entitles it.

IMPROVED FARM MACHINERY.

In view of the aspect of affairs in the winter of 1861, the policy of the Board was thus early decided upon to use the means at their disposal and every available facility to multiply and improve labor-saving farm implements and machinery. This seemed to be their first official duty; and, accordingly, the premium list of the society in the Mechanical Department was thoroughly revised. The amount offered in premiums in that class for the year 1861, exceeded three fold that offered in any preceding year, resulting, whether for that or some other reason, in a display of implements and machinery and devices in the mechanic arts at the annual fair of that year, never before equaled on any similar occasion in this State.

It was deemed by all reflecting persons who witnessed it a proud and most assuring evidence that even the terrible internal convulsion, which was then just beginning to be felt by the nation in its full force, would fail to paralyze or seriously disturb the industry of the people. Apprehensions so generally entertained, that agricultural production would be much lessened by reason of the withdrawal of a large per cent. of farm laborers to fight the battles of the country, were quieted if not entirely removed by that single exhibition of the numerous triumphs of inventive skill, and the knowledge it afforded that inventors and mechanics and manufacturers fully comprehended the importance and the resulting profit of redoubling their energies to compensate for the loss of manual labor in the field.

Pursuing the same policy of encouraging invention, the Board, in July of the following year, held a field trial of implements used in harvesting. The location selected was near the city of Dixon, in Lee county. The number of entries for that trial were, of com-

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trial was conducted, and which will be found on succeeding pages; desiring to add to that simply a confirmation of our opinion therein expressed of the great practical value of all such competitive exhibitions.

During the next following year, 1863, a field trial of Earth-displacing Implements was held near the city of Decatur, under the auspices of the Executive Board. The list of entries comprised—Plows for general purposes, Gang Plows, Trench Plows, Cultivators, Corn Planters, Field Rollers, Harrows, Seed and Grain Drills, Broad-cast Sowers, Corn and Cane Cutters. Again we were gratified and astonished by the evidence of rapid progress in the improvement of this class of machinery. Almost all of the implements presented for trial were, either in whole or in essential parts, inventions of very recent date, and it is safe to say that their use upon the farm as compared with the use of those chiefly employed for the same purposes a few years previous, would result and has resulted in an actual saving of one-third to one-half of the labor and cost of the operations performed! This was clearly apparent and unquestionable as regards those implements employed in the preparation of the soil, and after culture and handling of Indian corn, the great staple crop of Central Illinois.

It may not be improper to call attention to the fact that with few, if any, exceptions, the implements tested were invented and manufactured by citizens of this State, notwithstanding competition from abroad was warmly solicited. The report of the Awarding Committee, very full and complete, will be found it its place in this volume.

Marked and wonderful as have already been the improvement and economy of labor in the use of machinery on the farm, that improvement still continues apparently without check or abatement. The smooth surface, the easily worked soil of the prairies, and the appreciative enterprise of our farming communities all conspire to facilitate invention, and to reward it abundantly. So that it would seem the time cannot be far distant when, in the matter of improved means and methods of culture, there will be little left to be desired. The introduction of steam as a successful motive power

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so cheaply, trained so perfectly, applied so readily to the farmer's use, under so great a variety of conditions and for such a multiplicity of purposes, and in any event are likely to be required for the after culture of many of our most important crops, as well as for the service of thousands of our citizens who are not farmers, it does not seem probable that they will soon be supplanted by any other motive power for general use on the farm. Still we do not seek to repress the efforts of those who differ with us in opinion and who are bending their energies to the work of substituting steam for animal power in farming. We certainly wish them "God speed" and will rejoice as heartily as they when permitted to witness and chronicle their success. To inventors generally, whose quiet labors have so signally benefitted the country during the past few years by enabling the farmer to perform his work with far greater rapidity and in a much superior manner, we desire to make this acknowledgment as due from those whose duty and pleasure it has so often been to observe the triumphs of their skill.

MANUFACTURES.

For reasons already assigned we can present no reliable data showing precisely or approximately the progress achieved in this branch of domestic industry. That some advance has been made, and that, too, very considerable, is well understood. The skilled labor required to prosecute it has been at various times difficult to procure, and often unsettled and unreliable. High prices for labor, as for everything else, have prevailed. Old establishments, however, in nearly every instance within our knowledge have sustained themselves, and in many departments their production has been largely increased. This has been the case not merely with those engaged in the manufacture of articles of whatever nature required for use in the army, but the same prosperity has extended to and an equal activity pervaded them all. As men were withdrawn

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required to give this State prominence as a manufacturing district are, and have been, here. The contents of this volume alone present most convincing evidence of the fact as stated. With coal of excellent quality and in quantity beyond the power of figures to express underlying at easy mining depth more than three-fourths of the State's surface—the common useful minerals either found here in large quantities or readily obtained from immense natural deposits—the Illinois, Rock, Fox, Kankakee and many other rivers and streams capable of furnishing water power almost beyond computation—a soil and climate admirably adapted to the production of all the materials which soil in the temperate zone anywhere can be relied upon to furnish, whether it be fibres or breadstuffs and provisions, there surely can be no assignable reason why we may not soon become noted as a manufacturing State. There are many considerations which render the realization of this result at an early day desirable, and which point with unerring certainty to that end. We cannot long afford to disregard our natural resources, valuable only as they are made available. We cannot always see the waters of our streams run on in crystal purity to the ocean without adding to the wealth and welfare of our people; we shall not forever leave our great coal bed undisturbed save as its black diamonds may be needed to warm our bodies or cook our food, and we certainly shall not forever consent to be simply "hewers of wood and drawers of water," by producing only the bulky necessaries of life and the raw materials for commerce, paying transportation on them thousands or even hundreds of miles, and receiving in exchange costly manufactures which might be fabricated at our doors at far less expense to us. The past four years have afforded us a rich experience, and the lesson cannot be forgotten. The impetus given to every department of manufactures which had obtained a foothold—the now augmented capital—the inviting facilities profusely abounding on every hand—the certain and remunerative market north and south and west of us, as well as in our midst—the attention of our people now becoming fully aroused and comprehending the "situation," will, we trust, soon open to us as a State new avenues leading to wealth, prosperity and a proper independence.

DOMESTIC ANIMALS.

Adapted, as this State is, throughout its entire limits and in every part, to a system of mixed husbandry of almost unlimited variety,

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it is peculiarly suited by nature to the profitable production of domestic animals. With very moderate care from man they multiply and flourish. Possessing a climate not rigorous on the North border, of great mildness in the South and of salubrity throughout, a soil of wonderful average fertility and yet varying in elements in different localities, the prairies in their natural state affording an exuberant pasturage of the most nutritious grasses, and yet producing, when a change is desirable, a luxuriant growth of the cultivated species, both pasture and meadow, it should not surprise us that Illinois, at a very early period in its history, attained celebrity as a stock growing district. The pre-eminence in this respect since it was attained, has been held without question down to the present time, and we can observe no reason why it should not be maintained for many years to come.

The report of the first gun fired at Fort Sumter found our fields, and stalls, and pens well supplied with material for the equipment and maintenance of the armies who were summoned to the battle by that alarm, and the government has drawn upon our farmers at sight as its necessities seemed to require, without the dishonor of a single draft.

HORSES—

Of these there were listed for taxation, in					1858	513,030
"	"	"	"	"	1859	532,247
"	"	"	"	"	1860	590,963
"	"	"	"	"	1861	625,242
"	"	"	"	"	1862	664,194
"	"	"	"	"	1863	652,500

The lists for 1864, in possession of the Auditor of State, are not yet made up. It will be observed that up to 1863 the number of horses listed for taxation annually increased, and that in the last named year they fell short, as compared with 1862, 11,694. It is highly probable the lists for 1864 would show an equal decrease. The average annual increase from 1858 to 1862, inclusive, was

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be remembered that the cavalry arm which had been comparatively neglected during the first and second years of the war came rapidly into favor and so continued during 1863 and 1864. So that while we cannot arrive at the precise truth, it may be stated with confidence that from May, 1861, to January, 1865, Illinois furnished to the United States army, in its various branches of service, not less than 150,000 horses. Of this number a large proportion were young, sound, serviceable animals of excellent quality, and we regret to be compelled to add, that very many of them were breeding mares of sound constitutions and good substance, which, but for the necessities of the country, it had been better to retain at home. The loss in this regard will be difficult to repair at once. The attention of breeders has, however, been strongly directed to the importance of increasing and improving this class of stock, and with the facilities enjoyed for doing so they must soon refill the places here of those faithful servants whose bones now whiten every battle field in the southwest. Quite a number of thoroughbred stallions have recently been introduced from the "race horse regions" of the middle and southern States, but whether as a whole their impress upon the stock already here will be a benefit or a detriment, is, to say the least, an unsolved problem. Certainly it will not be a benefit, unless great care be observed and good judgment exercised in crossing. Due regard must be paid to size, freedom from constitutional defect, and particularly to temper. A thoroughbred horse, sixteen hands high, well formed, well descended, sound and tractable, is perhaps the very best horse for general purposes. On the other hand a thoroughbred horse which is small, ill tempered, or unsound, is utterly useless for breeding purposes, and his progeny apt to become in the hands of the common farmer an intolerable nuisance. What is especially needed in the great mass of the horse stock of this State now, is increased weight and substance, with muscular power in due proportion; and these may be readily attained within a reasonable time by a judicious use of the materials already at hand.

Our annual fairs have presented many superior specimens of the English draft horse and his grades. In some localities they are becoming quite abundant and are justly esteemed for their docility hardiness and strength. As the basis of a stock of horses adapted to the wants of the farmer who "ploughs deep while sluggards sleep," they deserve to be regarded with much favor.

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In addition to the varieties named—the thoroughbred and English draft horses—we have all the intermediate grades and crosses, mingling in different proportions the characteristics of these widely dissimilar types. Some of them, as the Morgans and Bellfounders, are so uniform in trait and appearance as to claim with strong show of justice, the consideration due to distinct breeds. Previous to the rebellion, for many years the planters of the southern States annually obtained from Illinois a considerable part of the animal power used upon their plantations. For our surplus horses and mules these States formed the chief market. This market must soon be open to us again with a demand largely increased by reason of the almost entire destruction of this class of stock in those localities, and it will be limited, for a time at least, only by their ability to pay for the animals needed. Immigration from the eastern States and Europe, which, even now, is pouring in upon us and occupying our cheap and fertile lands, must find its requisite domestic animals here; and we therefore infer the prices now asked will be maintained for some years, and that those who are engaged in breeding horses may feel assured this branch of husbandry cannot soon fail to be remunerative.

MULES AND ASSES—

There were listed for taxation,			in 1860,	36,371
"	"	"	1861,	39,278
"	"	"	1862,	41,038
"	"	"	1863,	40,675

As in the case of horses, this State has supplied the armies with a large number of serviceable mules. The rearing of this class of stock has received its full share of attention. Little improvement can be expected where, as with mules, nature has placed so close a limit to progression, and refuses to establish a race, by withholding the inherent power of continued existence. Yet something has been accomplished by the careful selection of the parents—size being the point of most consequence, and comeliness not always attainable.

NEAT CATTLE.—Until within a few years the prairies of Illinois

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Any departure from this routine was exceptional. As, however, our lands were brought under cultivation, corn largely grown, and blue grass came to be appreciated, all this rapidly changed. Illinois cattle began to be enumerated in the eastern market reports, and Illinois feeders began also to draw upon the States and Territories on the west for stock cattle for stall feeding. Our teeming corn fields were found to yield more of the great staple than home grown herds could consume. Chicago, our own commercial metropolis and miracle of substantial growth, soon attained position as the most extensive beef packing point in the world. The number of cattle from this State presented for sale in the New York market, day after day for several years, has been in large proportion to the number presented from all other States. The whole number of beeves received in that city in 1863, was 264,091, of which 118,692 were from Illinois. Of course the Chicago packing houses and the consumption of that city have drawn from Illinois their chief supply, while government contractors and commissaries, in the west at least, have found here their main dependence. Bearing in mind then this immense draft upon this State for fat cattle, the facts disclosed by the following figures will very much surprise those who have not heretofore given the matter close attention.

In 1859	there	were	listed	for taxation	of neat cattle	1,337,565
In 1860	"	"	"	"	"	1,425,978
In 1861	"	"	"	"	"	1,428,362
In 1862	"	"	"	"	"	1,603,949
In 1863	"	"	"	"	"	1,684,892

Showing an increase between the 1st of April, 1861, and 1st of April, 1862, of 175,587; and between the 1st of April, 1862, and the 1st of April, 1863, of 80,943!

In December, 1853, one of our most intelligent and thoroughly posted cattle breeders and feeders estimated the number of beeves fattened in this State that year at 50,000; so that we may arrive at some conception, even if quite imperfect, of the rapidity with which this branch of industry has increased of late, and of its present magnitude.

Of the improved breeds of cattle, it will be readily inferred the Durham has recived most consideration at the hands of our breeders. Many small herds, and some large ones, are found well distributed over the State, and nearly all our common stock has an infusion of more or less short-horn blood. The immediate effect

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of this is to render our beef cattle favorites with the packer and butcher, as well as the consumer. At no time in the history of the State have breeders of pure blooded Durhams bestowed more care upon their herds or effected improvement more rapidly than during the past four years. The thoroughbred shorthorns, imported by the Illinois Stock Importing Association in 1857, proved to include many animals which have been crossed with the herds then here, with marked advantage, and it is believed the exhibitions at our annual fairs of this breed, compare very favorably with any such exhibitions elsewhere. On all such occasions competition from abroad is invited, and rarely the invitation has been accepted.

There are a few choice, and indeed very superior Devons owned in Illinois; but while all admit their unexcelled working qualities, their great beauty of color and uniformity, they have not been so generally sought for and prized as the Short-horns. This Society has ever extended to the Devons the same encouragement in the offer of premiums as has been extended to any other breed, but the specimens at our Fairs, although very fine, have not been numerous, nor have they attracted the public attention to which their intrinsic merits, perhaps, entitle them.

Of other pure breeds, we have a few Alderneys, Jerseys and Ayreshires—so few in number, however, as not yet to have made any considerable impress upon the general stock of the localities where they are owned.

It is proper to state that dairying—the manufacture of butter and cheese—has not, except in a very few localities, assumed a position as one of the leading interests of the State. A few good butter-makers and a few cheese-makers to a limited extent may be found in nearly every county. There are good milch-cows to be obtained almost anywhere, yet for some reason, first rate butter and cheese have been neither abundant nor cheap. These important articles of consumption in every household have been largely supplied, even in the capital of the State, from Indiana, Michigan, Wisconsin and Ohio. With facilities for dairying so abundant, with a market so constant and remunerative, we cannot assign any reason why Illinois should not take a front rank as a butter and cheese

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troduction of cheese and butter factories similar to those operated in New York with such marked success, we may expect some improvement in this branch of farm economy. We regard this as one of the most prominent fields for enterprise now open to the Illinois farmer, and hope soon to note a change of policy among intelligent agriculturists which shall lead them to make available the materials for creating wealth, so abundant on every hand. We are quite sure the subject well deserves the earnest attention of those who desire to benefit themselves financially, as well as contribute to the general prosperity of the commonwealth.

Sheep.—If there be any one branch of husbandry in which the State of Illinois should and, as we believe, will become especially prominent, it is the production of Sheep and Wool. We found this statement not simply on the facts, that wool-growing here has been very profitable, that the soil and climate are peculiarly favorable, that the number of Sheep and the number of flock-masters have multiplied with great rapidity within a few years; but we add to these another consideration, which is clearly seen and beginning to be felt with great force. Woolen manufactures must be largely increased. The necessity exists and the facilities abound. If the wool-growing interest has flourished in the past, when the product was transported a thousand miles and disposed of at prices, in fixing which the wool-grower had very little to say, what may we not reasonably expect when it shall have become the basis for a profitable manufacture at our own door? Already, capitalists, and even the farmers themselves, by associated effort, are moving in this direction. The early future will witness changes of great magnitude and significance. In our judgment, there is no more or greater necessity for our continued dependence upon Europe or New England, or any region beyond the borders of this State, for woolen fabrics—except, possibly those of the very finest texture and material—than upon Pennsylvania for coal, or Lake Champlain for ice; and when the country shall re-enter upon the paths of peaceful progress, capital, industry and enterprise be left free to select their own fields for operation and development, we may look with great confidence to the establishment of woolen manufacture, upon a broad and permanent foundation, to assume, in time, proportions commensurate in some good degree with the facilities available, and the market to be supplied. It is easy to conceive the action and re-action between sheep-husbandry and

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the manufacture of woolen fabrics, when brought so closely together as they must then be, under conditions so favorable to both.

The number of Sheep listed for taxation in 1860 was		584,430
1861	"	731,379
1862	"	913,024
1863	"	1,206,625

Aside from the omission from the enumeration of 1863 of the sheep listed in the counties of Clinton, Douglas and Saline, it is quite certain that the whole number as stated is much below the fact.

While there has been for the past four years a considerable increase in the number of sheep owned in the State, the improvement in quality is even more marked. The great mass of those imported from other States are high grade Merinos, and, such has been the good judgment and enterprise of breeders, very few of the old native stock remain in their flocks. The fleeces which find their way to eastern manufacturers are chiefly of the quality known as *delaine wools.* There are some choice flocks of mutton sheep: Cotswolds, Leicesters and Southdowns, held in high favor by many farmers, and popular with the consumers of this healthful meat. That they have not become more numerous may, parhaps, be accounted for by the fact that they are not so easily herded (grazed in large flocks on the prairies,) as the Merinos and their grades.

Before dismissing the subject under consideration, we beg to ask the earnest attention of the General Assembly to one point, and to insist respectfully but most seriously and earnestly that some action be taken upon it. If your honorable body agree with us in opinion that this interest—sheep-husbandry and its kindred and dependent industry, woolen manufacture—should be fostered in all proper and legitimate ways, we are confident you cannot, upon full knowledge of the facts, refuse the encouragement which would be afforded by the enactment of a law, taxing, out of existence if need be, the hundreds of thousands of prowling curs, already useless for any good purpose, and constantly devastating the flocks of the shepherd. The prairie wolf, once the terror of the flock-master, is now an inoffensive creature, compared with the dogs which civilization (such as it is,) has brought in his stead. We have not even an approximate estimate of the loss of sheep from this source in this State; but the aggregate number must be very large, and the money value startling. In the absence of any statutory provi-

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sion for collecting statistics of this character, some associations have attempted it for certain localities, and will, we trust, be ready to report at an early day of your next session.

SWINE—

The number listed for taxation in 1860 is	1,530,256
1861 "	2,196,581
1862 "	2,601,395
1863 "	2,506 138
Of hogs (live and dressed) there were received at Chicago in 1861	675,902
1862	1,348,890
1863	1,677,757

As indicating the proportion of these for which this State is entitled to credit, it may be stated that in 1863–4, the year ending March 31, 1864, the whole number received was 1,677,757, of which only 30,605 were received by railroads whose lines extend beyond the limits of the State.

It will be readily seen that the swine of the State form a very important source of wealth to the farmer. Indeed, so long as the present system of fattening cattle in open lots, placing shock-corn on the ground and permitting them to run over it at pleasure, shall prevail, the necessity will continue to fatten hogs upon the corn left by them upon the feeding grounds, and which would otherwise be wholly wasted. Such is the method now generally pursued in the central counties, and, practically, the hogs which thus become the gleaners afford, when marketed, a large share of the profit which feeders expect to realize. Elsewhere, however, by many farmers, hogs are reared, fattened and relied upon as the main crop.

In Swine, as in the other vatieties of domestic animals mentioned in this Report, we have to chronicle a decided improvement in quality. Much attention has been given to retaining distinct breeds in their purity, particularly the Berkshires, Suffolks, Chester Whites, and perhaps others. This branch of industry has shared in the general prosperity of the past few years, and, although occasionally suffering in loss of animals by cholera, has well repaid those who have been engaged in it.

CEREALS.

This State has a surface area of 55,405 square miles, or 35,459,200 acres. We are not able to state the proportion of land and water surface, but the latter cannot be considerable, as we have neither lakes nor many large streams within our borders.

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In 1861, there were cultivated in Corn	4,212,696	acres.
" " " Wheat	2,546,409	"
" " " other field products	1,105,148	"
Total	7,864,253	"

Not included in this enumeration are the counties of Carroll, Du Page, Madison, Pope and Washington.

In 1862, there were cultivated in Corn	4,014,077	acres.
" " " Wheat	2,447,103	"
" " " other field products	1,245,735	"
Total	7,706,915	"

Not included are the counties of Carroll, Clinton, Douglas, Marion, Pike, Pulaski, Randolph, Saline, Sangamon and Washington; they not having reported. The lists for 1863 and 1864 are not yet made up by the Auditor of State. We have no means of verifying any estimate which may be made as to the average yield per acre of either Corn or Wheat. Probably 35 bushels for the former, and 12 for the latter, would be generally assented to as quite low enough. Taking those figures as, at worst, not very wide of the mark, the counties reporting as above produced—

In 1861, of Corn	147,444,360	bush.
" Wheat	30,556,908	"
In 1862, ot Corn	150,492,195	"
" Wheat	29,365,236	"

The apparent falling off for 1862 is doubtless accounted for by the failure of several of the largest corn and wheat-growing counties in the State to report.

During the year ending January 1, 1862, there were received at Chicago, of Corn	26,269,989	bush.
The number of bushels arriving by railroads whose lines extend beyond the limits of the State, was only	69,430	"
Leaving as the estimated product of this State marketed in Chicago, in 1861	26,200,559	"

During the year ending January 1, 1862, there were re-

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grain-producing region, and to confirm the expectation raised by the statistics and estimates in regard to the rearing and fattening of domestic animals. It should also be remembered, that only about one-fifth part of the surface area of the whole State is in cultivation, and that, except the market and private vegetable gardens, scarcely a single acre is tilled so as to approximate the highest point of profitable culture. A few good farmers in every county, whose crops of corn for a series of years average from 30 to 60 bushels per acre, and whose wheat crops yield from 12 to 20 bushels per acre, are standing witnesses to the fact that the low general average yield of the State is referable solely to indifferent culture; that neither unfavorable climatic condition nor lack of fertility is responsible. Even the use of improved machinery and implements, while it has enabled and induced farmers to till more ground, and has thus largely increased the aggregate number of bushels harvested, has not in any very marked degree increased the average yield per acre. Lands are cheap and labor dear; farms are large, the hands to till them few; the soil is fertile, and generally yields what are regarded as abundant harvests, if the husbandman put forth but the slightest efforts; lands, if simply held without tillage, add to the wealth of the owner by steadily enhancing in market value; farmers, as is the case with the entire American society, and especially with society in the western States, are, compared with communities of the old world, restless and unsettled; our laws favor if they do not really compel the division of estates once in every generation; Illinois youth, by the universally well maintained common schools of the State, are educated to assume, within the scope of individual capacity, any position or avocation consonant with their taste or feelings; and it therefore is, that farmers' sons do not always choose the occupation of their fathers; systems and methods are not handed down from generation to generation. Experiments for the improvement of herds or flocks which require more than twenty-five years to complete them are rarely brought to completion. Each of these considerations has its influence to discourage systematic and persistent thoroughness in farming, and certainly to delay the erection of the permanent, finished farm structures, which abound in Great Britain and on the continent of Europe.

It must not, however, be inferred that no considerable improvement has taken place; for, while it is true that the operations of

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husbandry are as a whole affected unfavorably by the circumstances and conditions named, yet there is marked and steady progress in all that contributes to the prosperity of agriculture and to the happiness and well-being of all engaged in it in Illinois. Reversing the old adage, the stones do roll and they also gather moss; and while on every hand there are plenty of good farmers who till thoroughly, improve their farms admirably, and grow rich rapidly, we may not hope for the general prevalence of skillful culture guided by practical science and bringing its highest reward, until landed estates are smaller than now, population much more dense and the temptation to *expansive* agriculture passed away. As immigration pours in upon us and our cheap tracts of unoccupied lands become the homes of the industrious of all nationalities, manufactures become established in every part of this inviting field, and population begins to approach a maximum density, the harvests of the agriculturist must be increased far beyond our present conception of what is possible and very far beyond any existing example.

HORTICULTURE.

We might, perhaps, well content ourselves with a simple reference to the papers and proceedings published in this volume of the state organization whose special province it is to promote the welfare and prosperity of this branch of industry, not inappropriately termed, "one of the fine arts." We point with honest pride and unalloyed pleasure to the progress of horticulture in this State for the four years last past. Its practice and the enjoyment it affords are well nigh universal. Every man or woman who owns a rood of land worships at the shrine of its presiding deities, and, whether for business or for pleasure, it has been pursued with general success.

We regret our inability to present the statistics of tree-planting and fruit-growing since 1860, confident they would give evidence of an enterprise, prevailing good taste and refinement on the part of the people of the State deserving more than a transient thought.

While the peach and some other tender varieties may be confined for production to the southern portion of our territory, the other standard fruits—the apple, pear, plum, cherry, grape and all the small fruits—have flourished throughout our entire limits. It is especially worthy of note that experiments already made along our western border warrant the conclusion that the culture of the vine

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and the manufacture of wines in that region will soon become a leading interest. The conditions of climate and soil necessary to the production of abundant crops, and first rate wines, together with immunity from disease which is often fatal to the hopes of the vigneron elsewhere, seem to be present in that favored region. We trust that expectations now raised in this regard, will not be disappointed, and that, in the course of time, the vine growers of the Mississippi may eclipse those of the Rhine, bring wealth to the State and win such as will persist in regarding something else a better daily beverage than pure water, from the nauseous and noxious poisons of the distilleries to the less deadly and more grateful nectar of the grape.

The quantity of fruit grown in this State (perhaps the remark should be confined to apples, pears, peaches and grapes) large as it is, is not, nor ever has been sufficient to supply the demand for home consumption. So rapid has been the increase in population and so commendable the taste of our citizens that our immense production of fruits fails to supply them in the quantities demanded. Hence we, every year, import largely from Michigan, Ohio and New York. Most of our orchards have not, it is true, attained the age of full bearing, but it will be many years before the orchards and vineyards of the State, stimulate tree and vine planting as we may, will furnish the fruit consumed by the residents of the State. Let no man, therefore, who notes the thousands of acres annually planted to orchards hesitate or plant one tree less for that reason. As it is to-day, so it will continue for at least one generation of fruit trees. The farmer's orchard pays him a far better revenue than any other equal area of his farm costing no more in annual care.

MISCELLANEOUS.

This review would be very incomplete did we fail to note the impetus given during the existing rebellion to several branches of industry heretofore pursued and the introduction of some in which our people have not previously engaged.

The Culture of Cotton has been attended with very decided success, and under the stimulus of high prices is likely to be maintained for many years, and the fibre to become a staple product in this State. The counties south of the Ohio and Mississippi railroad seem to be adapted to the growth of the plant and the season in that latitude to be long enough to insure the maturity of the bolls. Many of the residents were familiar with its culture and pre-

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paration for market and at once responded to the increased demand by efforts to produce it. Whether it will remain to us as a crop long after the States further to the south shall have resumed their usual quiet and returned peacefully to their ordinary labors, is perhaps questionable; for the present, however, it is, and for the immediate future it must remain, a highly remunerative field crop.

Sorghum Sirup.—Much has been saved to the people of this State by the timely introduction of Chinese and African Sugar canes. The cultivation of the plant and the manufacture of the sirup have proven alike successful wherever attempted; and it is difficult to decide whether this or that portion of the State—this or that soil, is better adapted than any other to the production of either the cane or the sirup. It may now be confidently regarded as an established branch of agriculture and manufacture; for so simple is the process, that the man who produces the crop of cane is ordinarily quite competent to manufacture it into a palatable sirup. Many have been the attempts to make from the juice a merchantable article of sugar with sufficient certainty and rapidity to justify the belief that it might be relied on for that purpose; but such attempts have not as yet been crowned by success. Inventor after inventor has claimed to have discovered the process by which this result could be obtained, but thus far has uniformly failed to make good his claim to the public. That the juice contains a considerable per cent. of crystallizable sugar, is certain, but no chemist has yet made known a practicable mode of rendering it available for commerce.

Tobacco.—The culture of this plant and its manufacture have increased for the same causes and in nearly the same ratio as the production of cotton. In 1862, 1863 and 1864, it assumed a leading position among the field crops of several counties in the southern portion of State, and received much attention from many farmers in more northern sections. A large profit to the producer has been realized, and it will doubtless continue to be cultivated quite extensively in some localities for several years.

Hemp.—This crop has also felt the influence of high prices occasioned by both diminished supply and increased demand, although it has not been grown in this State to the extent warranted by its profitableness and our facilities for production as well as preparation for market. The true hemp region on this continent is pronounced by good authority to be north of a line running east

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and west through the southernmost point of Iowa, and continued through this State. That it can be grown here of the finest quality, and that water for rotting it is easily obtained almost anywhere in the district of country alluded to, is true. The strong, corn-growing soils of Central and Northern Illinois could hardly be excelled for this purpose, and we hope to see them turned in due proportion to the culture of this important fibre.

Flax.—Much more has been done in the growing of flax than of hemp; and many thousands of acres have been cultivated with fair return to the farmer. A market for the straw at remunerative prices has been created by the invention of machinery for working it up, and it is thought by some that the fibre will, at an early day, be reduced to such condition as to be readily spun by machinery now used in the manufacture of cotton cloths. Should this expectation be realized, flax may become a very important staple crop in the north-west.

Castor Beans.—These are largely grown in a few counties in the south western part of the State, and although we have not the figures showing the number of bushels exported in any one year, we are assured they have become, as they once formerly were, a very important source of income to the producers. Exceedingly sensitive to frost, the plant is not cultivated for the manufacture of oil north of the Ohio and Mississippi Railroad. During the rebellion, and stimulated by an advance of two hundred to four hundred per cent. in prices, the culture of the Castor Bean revived from almost no product whatever in 1860, to many thousand bushels in 1864. When, however, the extraordinary demand shall cease, or quiet be restored in the southern States, where it may be pursued with certain immunity from frost, it is probable the production of this crop will be gradually lessened, until, even in the locality alluded to, it substantially ceases altogether. This result may be avoided to a certain extent, by establishing mills for the manufacture of the oil in close proximity to the bean fields, instead of transporting the crop to St. Louis or elsewhere to be worked up. In this, as in all other cases, where no insurmountable obstacles exist, we hope and expect, in due time, to see the raw material found or produced in this State for any manufacture whatever, receive its finishing touch for the markets of the world from the skilled labor of Illinoisans, in Illinois factories and workshops.

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ENTOMOLOGY.

Our duty would be imperfectly discharged, did we not ask your attention to the annual loss sustained at the hands of insect enemies, by every one who is engaged in the production of grains, grasses, fruits or vegetables. Illinois is no exception to the general rule on this subject. Not one of the grains—not one of the grasses—not one of the fruits, nor a single vegetable cultivated in any part of the world for the benefit, direct or indirect, of man, is wholly exempt from the attack of insect foes. The most casual observer is aware of the fact, as stated, but few realize the extent of the loss thus occasioned, while still fewer seem to know that it is possible to prevent it in whole or in part.

It is stated by competent authority, deduced from careful calculations and estimates, that three hundred millions of dollars would not cover the annual loss to agriculture in the United States by reason of insect depredations, and that a full proportion of this is borne by the people of this State.

It is believed by us, and the opinion is concurred in by all who have examined the subject, that a very considerable part of this sum might be saved through the labors and investigations of a competent Entomologist, and that it is the duty of the General Assembly, on behalf of the State, to provide at an early day for the most thorough and scientific experiments, with a view to placing before the people reliable information in regard to the habits of insect enemies, and the best means to avert the destruction occasioned by them. The appropriation of not more than $2000 per annum, to be continued only on condition that practical benefit to the agriculturist shall result, will be quite sufficient to make the experiment.

COUNTY AGRICULTURAL SOCIETIES.

While regiments were being raised in every county in the State—fathers and sons leaving their homes for the battle-field—it will hardly be supposed that local organizations of this character could continue in operation as in times of peace. Their grounds were, in many instances, converted into military camps, and their most active members devoted themselves to the service of their country. Accordingly, quite a number temporarily suspended their efforts as societies, and ceased to hold their usual annual fairs—in some

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cases for a single year only, in others longer. Yet there were many which pursued the even tenor of their way, and held very successful fairs each year from 1861 to 1864. Reports from thirty-four societies will be found in their appropriate place in this volume. They give evidence of enterprise and energy in promoting the industrial interests of their respective communities, and afford abundant assurance that the bounty of the State directed to their organization and maintenance is not misplaced. When the country shall again be blessed with peace, and 'swords shall be beaten into plow-shares, and spears into pruning hooks,' we trust that every county in the State will enjoy the benefit of an active County Agricultural Society. Except in unusual times, the prosperity of these associations may be taken as an almost infallible criterion by which to judge the thrift and public spirit of the agricultural communities in which they exist. When men pursue farming as a business—not simply to live, but to accumulate pecuniary wealth and independence, for the education and refinement of themselves and their families, these County Agricultural Societies and Farmer Clubs abound; agricultural and literary periodicals are taken and read; public schools are maintained; improved implements, improved breeds of animals, the best varieties of seeds and fruits are introduced; and, as ability to do so follows, the farms and their surroundings become the homes of intelligent, thriving, self-sustaining communities.

INDUSTRIAL UNIVERSITY.

In 1862, the Congress of the United States passed an act donating to the several states, on conditions therein stated, public lands, to be applied to educational purposes in the manner specifically set forth in the law. Complying with the terms imposed by Congress, this State has received land warrants or scrip for four hundred and eighty thousand acres, and we trust will in due time appropriate the proceeds obtained from the sale of it wisely and in strict accordance with the provisions of the act making the grant. Without discussing any of the questions which arise upon the organization of the institutions contemplated, we have thought it to be our duty to embody in this volume such facts as may be deemed important in tracing the history of this great educational movement of the age, and especially such as have transpired in our own State, among our own citizens. The proceedings of the various conven-

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tions held to consider this subject, together with other matter of of interest in regard to it, will be found in the appendix. For the rest, we publish the following letter from one of the chief actors from the very incipiency of the enterprise to the present hour, who knows whereof he affirms, and who, perhaps better than any living man, has a full personal knowledge of its history:

JACKSONVILLE, Nov. 28, 1865.

HON. JOHN P. REYNOLDS:

Dear Sir—You request me to communicate to you my personal knowledge of the origin and progress of the effort in this State, to secure the national endowment of our present incipient system of Industrial Universities. I can very readily state all that I know about it, in general terms, from the first origin of the idea to the present time.

During the thirty years that I was connected with the public schools and colleges, either as pupil or as teacher, and especially during the ten last years of my professorship in Illinois College, my mind was oftentimes oppressed with a sense of the utter inadequacy of our popular systems of education, to meet the obvious wants of mankind, and especially of the people of the great west. It at last seemed to me that nothing short of a combined national effort could successfully meet this want. I became utterly discouraged with our then extant systems, (if an hereditary chaos can indeed be called a system,) and abandoned them in despair, with the intent of doing what I could wholly outside of them. It seemed to me that unity of empire among a free people implied unity of educational plans and efforts, based on SELF-EVIDENT and therefore UNDISPUTED truths and facts. I am of the same opinion still, after more than twenty years of the best reflection that I am able to give to the subject. But when, where, and how propose the needful changes? That for years was the question, so far as I was concerned.

It so happened about the year 1848 or 9, I think, that I was called to preside over the Teachers' Institute in Pike county, during their session of a week or two. I conversed with the teachers there very freely on many topics, and during the session, and also on my return home at a public meeting in Griggsville, I briefly explained my views of a proper system of NATIONAL EDUCATION.

I was as much surprised and encouraged at the readiness with which the teachers there, and the people, seemed to fall in with and approve of that view of the case, as I afterwards was at the vehemence with which many of the friends and advocates of the old classical system assailed, ridiculed and denounced it, as "absurd," "revolutionary," "disorganizing," and above all, utterly "visionary and hopeless," even if desirable. This, so far as I am aware, was the first time such a scheme of public education was ever proposed to mankind.

In the fall of 1851 I was invited to address a convention of farmers and mechanics on topics pertaining to their interests, called by the Buel Institute, to meet at Granville, Putnam county, Ill., on the 18th of November of that year. I chose this subject for my main theme. Again the entire unanimity and heartiness of that convention entirely surprised me; while it was by no means lacking, to say the least, either in intelligence or in freedom of remark and discussion.

This, so far as I know, was the first deliberative body by whom this subject was ever discussed.* We are therefore in the habit of calling this our FIRST CONVENTION. What they did will appear from their report published at the time, and herewith appended. After this time, discussion, with the usual opposition, commenced in earnest, through all the accessible journals of the State, but mostly through the Prairie Farmer, ever, from the start, the steadfast and earnest advocate of our cause. Our State had at that time some several hundred thousand dollars of college and seminary funds, the annual interest of which they were

* For this and other papers referred to in this letter, see appendix.

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doleing out to our common schools, in a way that did them no good whatever, but rather an injury. This fund we desired should be appropriated to endow some one or more of the departments of our contemplated university, either the normal school or the agricultural, so that we might truly say, before we approached Congress for a general endowment, that we as a State had done something ourselves to show that we had a practical faith in our own scheme.

Our SECOND CONVENTION was called to meet at Springfield, June 8, 1852, with the special design of meeting and influencing the Legislature on this subject, with what success the appended report will show. A great outcry was made in many parts of the State, that "we intended to take this fund away from the poor children in the common schools, and build up aristocratical universities for the sons of the rich." Added to this, several of the old colleges of the State wanted this fund to be divided between their own institutions, and joined vehemently in the opposition; so that we could not get a dozen men in the whole Legislature to look even with patience upon our plans.

Finding that we could do nothing with the Legislature, we resolved to go behind them again, to the people.

Our THIRD CONVENTION was accordingly called to meet at Chicago, Nov. 24, 1852. At this convention the Hon. Bronson Murray, the first corresponding Secretary of the Illinois State Agricultural Society, (who at all times, so long as he remained in the State, spent time and money without stint in upholding and advocating our cause,) suggested and proposed the organization of the "ILLINOIS INDUSTRIAL LEAGUE," as a means of organizing and consolidating our efforts to move the public mind toward the end we desired to reach. The general design of that league, its plan of action, together with the report of that convention, are herewith appended. Of course the money in dimes collected from this league, did but very little toward meeting its current expenses; but the league gave us a name, a power and a foothold, and the additional expenses were defrayed by the immediate friends of the cause, and the greatest share of them by Mr. Murray himself, as pecuniary embarrassments at that time left me with but little to contribute but my own personal efforts and traveling expenses.

Under the auspices of this league, Mr. Murray, Dr. Rutherford, now of Quincy, but then professor and lecturer on physiology in our State, and myself, determined to canvass the State from town to town, so far as we could, and lay the subject before the people, and publish the results in the public papers. Dr. Rutherford continued to labor in this cause for many months with great success, but with little or no compensation. We spent a great part of our time and thought for a year or two in this effort, and with the most encouraging success. The plain, sturdy common sense of the people, wherever we met them, saw at once where their true interests lay.

Our FOURTH CONVENTION was held at Springfield, January 4, 1853, with a design of attempting again to move the Legislature to endow the normal school department, and, if practicable, also an agricultural department, from the above mentioned seminary and university fund in the keeping of the State; and also to petition Congress for a general grant of $500,000, or thereabouts, to each State in the Union.

We found the legislature surprisingly changed. They listened to us with much respect, and with an unexpected degree of favor. The people had turned their attention seriously to the subject, and we appeared before them not as one or two "d——d abolitionists, seeking to rob the dear children, and turn the world in general upside down," but as an organized force, that could command votes, and therefore, at least, would have respect. Our memorial and the report of that convention, together with the joint resolutions of the House and Senate petitioning for the proposed grant of an endowment from Congress, are herewith appended. And here again it is undoubtedly true, that the legislature of Illinois was the first political body that ever petitioned Congress, or any other power, for such a grant.

From this time forward, the great majority of our people and their representatives have been firm and steadfast friends and advocates of the good cause. They differ only about the best modes of securing, managing and appropriating the fund, and soon they will not differ even about that.

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Having thus practically secured our main ends, so far as State action was concerned, we decided to drop all public agitation at home, and quietly direct our whole force toward moving Congress to appropriate the grant, by private correspondence with leading and influential men of all parties and in all parts of the Union, both North and South. In this effort, though from its nature quite laborious and slow, our progress was much more rapid than we had any right to anticipate. We soon found that God had moved a great multitude of minds all over the country, to see and feel and think much in the same way as he had moved ours; and as often happens, the very ideas which we had till then supposed somewhat peculiar to ourselves, we found sown broadcast all over the continent, from the lakes to the gulf, and from ocean to ocean. All that was needed was merely to organize and marshal them, and direct them to some fixed result.

We received letters of encourgement from all quarters, and of despair from none.

During this interval, the Hon. Mr. Morrill, the representative from Vermont, first presented the bill to Congress, known as the "MORRILL BILL," and secured its passage through the House. We forwarded to him all our documents and papers, and gave him all the aid and encouragement that we could. He managed the cause most admirably; but the bill was at first defeated by the southern vote in the Senate, not because the southern people were opposed to it, far from it—as all our correspondence with them, and the utterances of their agricultural press, plainly showed. But their fire-eating, rebel representatives in Congress, had, even then, determined to do every thing which they thought would annoy and insult the North, force on the rebellion, and serve the devil generally and specifically. At the next effort it was passed by the Senate, and, probably by pre-concerted arrangement, vetoed by Mr. Buchanan. But at a third effort, the bill passed both houses, and ABRAHAM LINCOLN approved it. Fit end of a just cause.

As early as 1851, Jesse K. Fell, Esq., of Bloomington, (one of the earliest and most devoted friends of our cause,) and myself, sought for a spot suitable for the location of the University, at Bloomington, near where the NORMAL UNIVERSITY now stands. Another even more healthful and eligible site, near Peoria, was examined and approved by the friends of the cause, all other things being equal. In due time it came to be tacitly understood, that as our teachers were in great need of the NORMAL DEPARTMENT, the farmers should take hold and help organize their department first, and that then they would aid us in ours. It so happened that the people of Bloomington outbid the people at Peoria and all other towns in the State, and the NORMAL DEPARTMENT was located there, while a tract of land was still secured for the AGRICULTURAL and other departments. But lapse of time and subsequent changes have led many of the friends of both schools to doubt whether it is necessary or even expedient, to locate both schools together. Hence the other departments of the proposed Industrial University, are still open to bids or otherwise, for their location.

Our FIFTH CONVENTION, from these and other causes, was appointed at Bloomington, June 27, 1860. It was to us a sort of jubilee. We there saw the Normal School in most successful practical operation, diffusing its benefits over all parts of the State. The brief address of the president, Hon James N. Brown, the first president of our State Agricultural Society, and the resolves of this convention, are herewith appended.

It ought here to be mentioned, that the common school teachers of the State, as soon as they fully understood the object in view, in all their various conventions and resolves, co-operated with and cordially sustained the action of the League. The same is true also, of our various horticultural and agricultural conventions. Indeed our more recent conventions have been called and conducted by the general friends of the cause, without any special reference to the league as such. It would be difficult now, and perhaps needless, to mention the names of all who have freely sacrificed their time and money in this behalf. But there is one aged, venerable and beloved man, who, from the earliest times to the last of his days on earth, gave to this cause the heart and enthusiasm of youth, tempered and chastened by the maturity and experience of age. Dr. JOHN A. KENNICOTT, OF THE GROVE, former secretary of the Illinois State Agricultural

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Society. Substantially the same might be said of most, if not of all, the officers and leaders of our several State industrial associations, from the earliest times to the present day, and though belonging to all sects and all parties, it is very remarkable that not the first word of difference has ever been heard among us all, arising from any political or sectarian grounds. For instance, Senator Douglas and myself were at extreme antipodes in politics. I often wrote strongly against him over my full signature, and yet so fully and cordially did we agree on this subject, that it so happened that the very hour he lay dying at Chicago, I was writing him a long letter at his request, (at my desk here, supposing that he was fast recovering and would soon be at Washington,) in order that he might take up the special advocacy of our cause before Congress, which he had promised me he would do at the next session.

Our SIXTH CONVENTION was held at Springfield, June, 1863.

Our SEVENTH CONVENTION, at the same place, January, 1864.

Our EIGHTH CONVENTION was held at the time of the State fair, in Decatur, September, 1864. I forward the resolves of that convention. The further records you have in your possession.

In reviewing the history of this long struggle in defence of a true principle, one is strongly impressed with the vastly increasing interest which the masses of our people now feel in a proper education for all, as compared with what they felt twenty years ago. Then, almost the entire practical aim was to educate the divine, the lawyer, the doctor, and the professional men generally, to watch over and take care of the people; and ten or twenty thousand dollars was considered a great donation for any man to make to the cause of education. Now, the aim is more distinctly, to educate the whole people to "take care of themselves," and much larger benefices and donations, as well as public grants and endowments, have become quite common. For example, Ezra Cornell, Esq., of Ithaca, N. Y., has himself donated to the industrial university of that State more than five hundred thousand dollars in money and two hundred acres of good land, to be added to the grant of Congress, as a bonus for locating their institution at Ithaca. Thus the Empire State will start in her career of rivalry with her sister republics in industrial education, with a cash capital of more than a million and a half of dollars. Judge Parker, of Penn., has also given five hundred thousand dollars to found a similar institution at Bethlehem, in that State.

Smaller donations for similar objects have become too numerous to attract even a passing notice. Now I do not claim that these changes have been wrought solely, or even mainly, by the force of this new movement; but while it is not a sole cause, it has been at least one of the most efficient co-operators, and has led the people to see more clearly than they otherwise would have seen, how they can get hold of, and manage, a system of education that is worthy of their effort, their age, their empire and their renown. In obeyance to the same general causes, also meantime, nearly all our oldest and best colleges in the land have materially changed, and some of them have totally revolutionized, their old "*curriculums*," (as they were fancifully called,) which many good people supposed the very goddess of all wisdom and all sanctity herself, had ridden right straight down from the skies, and thus presented to mortals the only possible way back to her celestial abodes.

Several States have already started out with their new endowments and on their new system, or are prepared to do so, with cheering prospects of success so far as funds are concerned. But in other regards their plans of PRACTICAL ADMINISTRATION are wholly irrelevant or deficient, and I have no doubt that some of them will totally fail of the great end proposed, while others still will fall into the old ruts, only to get deeper in the mire than their predecessors did and have but a name to live while yet they are dead. But some of them will, I trust, at last succeed, and the others will live and learn, and I hope all will succeed at last, though probably not till after you and I are in our graves. You must have noticed with as great pleasure as I did, that the Hon. J. H. Klippart, of Ohio, in his letters from Germany, reports that the most learned and successful German professors consider that feature of our bill providing for corresponding secretary and actual experiments and reports in each county, as a "*sine qua non*," in prin-

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ciple, without which they consider an efficient agricultural school impossible. So far as I know, no other State has adopted any similar plan, and even we feared that it would appear too new and original to meet the views of our people; but it seems that our German friends take the feathers all out of our caps, by declaring it not new and original with us, but old and indispensable to all alike, and indeed so it seems to me, and as I could see no way to get along without it, I ventured to propose it, novel as it is to Americans, and as we then supposed to the world. When I see how liable we are to blunder and totally fail in the adequacy of our organization, I do not regret that we still have time to carefully review our present plan for a charter, and to add to it whatever else, (if any thing,) may yet be needed to give it the utmost efficiency and success.

It is extremely fortunate, however, for us, that all parties among our people are substantially agreed upon the needful principles of our charter, and that at the last session we only differed upon the principle of location, whether it should be by direct action of the legislature, or according to our more usual mode of fair competition between all the counties in the State.

Supposing that it might be well to preserve the records of these conventions in the archives of our society, or in your published reports, I have inclosed them to you in their regular order. As matters of history and for future reference, they may become of far more value than they seem to be now. You are at liberty to make whatever use of them, and this letter also, you may think most proper. All the other records are in your possession. Yours, truly,

J. B. TURNER.

INTERNATIONAL EXHIBITION AT HAMBURG, GERMANY.

It having come to the knowledge of the Board that the resident U. S. Consul at Altona, Denmark, is a citizen of this State, and that he would consent to represent the State Agricultural Society at the International Exhibition of Industry, to be held at Hamburg, Germany, during the summer of 1863, it was determined to appoint him to that position. He discharged the duties of commissioner for the State and representative of this Society very acceptably, and in due time forwarded the following Report, accompanied by prints of machines, &c., which we are compelled to omit:

EXECUTIVE COMMITTEE OF THE HAMBURG INTERNATIONAL EXHIBITION.

President—AUGUST JOS. SCHGEN, Consul of Nassau.

Vice President—J. F. W. REIMER, Vice Consul of Hayti.

Committee—Theodore Schmidt, Consul-General Oldenburg; Gustave Mutzenbecker, Esq.; H. Bieber, Esq.; Claus Olde, Esq,; Emiele Nœlting, Esq.; James R. M. McDonald, Esq.; G. F. Schwabe, Esq.; P. A. Ross, Esq.

Secretary—Dr. GERHARD HACHMANN, Hamburg.

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exhibition. It is true, I have devoted a great deal of time and attention to this exhibition—have watched with the deepest interest its progress from the commencement to the close, and yet with all my scrutiny, I am satisfied my report will fall very far short of doing adequate justice to such an immense undertaking. I will endeavor, however, to confine myself as much as possible to those subjects in which we in the United States are most interested, and so make my report as concise and simple as I possibly can.

The following is a list of the Countries represented at this International Agricultural Exhibition:

United States of America, Baden, Bavaria, Belgium, Brunswick, Canada, Denmark, Frankfort, France, Great Britain, Hanover, Hamburg, Hesse Cassel, Hesse Darmstadt, Lubeck, Mecklenburg Schwerein, Mecklenburg Strelitz, Nassau, Netherlands, Oldenburg, Prussia, Russia, Saxony, Austria, Sweden, Norway, Switzerland, Spain, Uruguay, Venezula, Wurtemberg; States of America: Illinois, Massachusetts, New York, New Jersey, Ohio, Rhode Island, Vermont.

The anticipations of all connected with this Exhibition have been fully realized, and its superiority over anything of its character ever held in Europe is generally conceded. Gentlemen from England, France and Germany, who have attended such shows in every part of the world for the past twenty years concur in the statement, that there has never been in Europe a more numerous nor a finer collection of animals brought together than at this Great International Exhibition of Hamburg. A list of entries, however, will give the best idea of its magnitude. These embrace over thirty different nationalities, extending from Russia on the north and east, to the States of North America in the west; the total number of which were as follows: Horses, 524; Cattle, 965; Sheep, 1,960; Swine, 293; Poultry, 328; Machinery and Implements of Husbandry, 2,941; Miscellaneous Products connected with Agriculture, 786. Of these, Great Britain contributed—stallions, 33; mares, 29; young colts, 5; bulls, 63; cows, 25; heifers, 44; rams, 135; ewes, 265; boars, 25; sows, 34; young pigs, 30; and Implements of Agriculture 740; other productions, 4. The judges of horses comprised Mr. N. G. Barthropp, of Suffolk, England, and Counts Waldstein, Schimmelmann, Plattenwedel and Prof. Dr. Rueff, of Germany. Among the judges for cattle and sheep, were Robt. Smith, Esq., of Devon, England, Messrs. Needham and Baldwin, of the United States; and Count Gustorw, of Holstein; Baron Maltzhan, of Mecklenburg, and Zimmermann, of Freidburg, Saxony. And for Agricultural Implements and Machinery, the following very talented jury: Prof. Ruehlmann, of Hanover; Prof. Arenstein, of Vienna; Hon. A. Baldwin, of New York; Prof. Wilson, of Edinborough; Count Reventlow, of Holstein; Prof. Hartstein, of Boem, Prussia, and O. Hedengren, of Stockholm, Sweden. The show of Horses was excellent; and in cart horses, the counties of Suffolk and Yorkshire made themselves conspicuous. The prizes for mares were equally divided between T. Crisp, Esq., of Butley Abbey; W. Wilson, Esq., of Baytham, Suffolk; J. Groves, of Kirkhammerton Lodge, and Mr. Holmes, of Beverly, Yorkshire. In riding, hunting and military horses, bred on the continent, Prince Lippesches Sennergestut took the first 400 thaler prize, with a stallion of Hanoverian breed, with English names in its pedigree. The Brewer, shown by Mr. Groves, of Wetherby, Yorkshire, and three Clydesdale mares, entered by Sir C. B. Phipps, from Prince Albert's stables at Windsor, also took prizes. In Short-horn Bulls, Lord Walsingham's Lord Lovell, and two fine white bulls, owned by Mr. Crisp, occupied first positions; as did bulls shown by Mr. Groves, of Park House; Lord Kinnaird of Rosse Priory; C. Olde, of Hamburg; Mr. James, of Northumberland, and Saddler, of Edinburgh. In Short-horn Bulls under two years old, Mr. Merten, of London, took the first prize with his white bull named First Fruits. In Sheep, classed as Merinos, we took the two highest prizes for quality and quantity of wool. There were 92 entries of this class, among whom were some of the first breeders of England, France, Saxony, Hanover and Holstein, but the awarding committee were unanimous in favor of the American sheep, and the honors were given to George Campbell, Esq., of Westminster, Vermont, the owner and breeder. A second prize was also awarded to him for Ewes. In South-downs, the honors were equally divided between Lord Walsingham, of Marlin Hall, Norfolk, and W. Taylor, Esq., of Harptree Court, Summer-

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setshire; except in one instance, where G. Loeppritz, of Gauterhof, Wurtemberg, carried away a prize of fifty thalers. Of Shropshire Sheep, there were 23 entries, and the prizes were equally divided between Guerrier, of London, and W. Humphrey, Esq., Oak Ash Farm, Berkshire. In Leicestershire, however, there was a much larger show, there being 92 entries. Some extraordinary fine animals were exhibited in this class, and the honors divided between England Schleswig, Holstein. The entries for Lincolnshire and Cotswolds were very numerous, embracing some 300 from England; the two highest prizes of which were awarded to T. B. Marshall, Esq., of Branston, Lincolnshire. In Long-wooled Sheep, bred on the continent, the Duchies of Holstein and Schleswig carried off the principal honors. Swine—Some of the animals in this class were of enormous size. One of them, a boar, weighing 1500 lbs. In fact, the large Yorkshire and Suffolk breeds attracted most attention, and the prizes were mostly awarded to these counties. John Hickman, of Hull, Yorkshire, took the first prize, with his boar Garibaldi, age 4 years and 2 months. The skin of this animal was more like that of a human being than a quadruped. I heard a gentleman remark that he was as fair as a woman. Hickman also carried off the two highest honors for Sows, with his Alice Maud, aged 4 years and 2 months, and a two-year old sow, named Duchess of Deningham. R. Smith, of Hull, had a very fine sow in this lot, of the same age, which took a second prize. If any of our people wish to improve their breeds, I can safely recommend them to these gentlemen. They are all old breeders, and men of high reputation. In Suffolk breeds, the honors were divided between W. B. Wainham, Esq., of Casehead, Yorkshire, and T. Crisp, Esq., of Butley Abbey, Suffolk. Berkshire.—In this class, the entries were rather few of mature animals, and most numerous in young pigs. The first prize for boars 2½ years old, was awarded to Her Von Spoerken, of Horndorf, Hanover; and for sows of the same age, to T. Crisp, of Butley Abbey, Suffolk, England. In young pigs, ranging from 6 to 14 months old, the prizes were chiefly awarded to Crisp, Wainham, Hickman, and G. M. Sexten, Esq., of Wheistead Hall, Suffolk. I have taken considerable pains to inform myself of these men, and from the best authority, I can recommend them as old and celebrated breeders of swine. And from personal observation, I am satisfied of the general excellence of their stock, as superior to anything of the kind shown at this exhibition. I have therefore, where I had occasion to mention their names, given their address also. Fowls.—The judges awarding prizes for fowls were Arthur Donner, Esq., of Altona, and Dr. Brehm, of Hamburg; and I imagine they had a very difficult task to perform. For the entries were not only numerous, (there being 340) but the collections were very fine and rich, in every variety of color and kind. In Cochin-Chinas and Bantams with legs clear of feathers, Rector Bockleman, of Osnabruck, Hanover, carried off the first prizes. He also got a medal for a coop of Black Malay hens, remarkable for their roundness of breast, and weight in proportion to size. A 10 thaler prize was awarded him for a new breed, called Elephants. This gentleman made over a hundred entries, embracing every variety of barn-door fowl, and carried of 35 thalers in prizes, and three medals, C. A. Wolff, Esq., of Barmen-on-the-Rhine, took the first honors for Black Spanish hens and Silver-haired Japanese fowls. C. Olde, Esq., of Hamburg, first prize for Black Dorkings, and Miss Nathusius, of Hundisburg, Saxony, first prize for English Game breed. F. L. Minton, Esq., of Bergadorf, near Hamburg, first prize for a coop of Polish hens, and a medal to E. Freiherr Von Merck, for a very singular French breed. This gentleman exhibited some very fine breeds of house doves: such as Carriers, Tumblers, Ruffs, Black Friars, Romish, and others, for which which he received a small silver medal. A medal was also given to F. Busch, of Mecklenburg, Schwerein, for a pair of white geese, of beautiful shape and immense size. This closed the principal awards for fowls.

Miscellaneous entries, from the Farm, the Orchard, Garden, Vinery, Cellar and Dairy.

Several Countries were represented in miscellaneous articles, as follows:

Austria sent Wheat, Cheese, Wine, Flax, Hops, Honey, Wool and Fruit. Baden contributed numerous samples of Rhine Wines, Cherry Cordial, Tobacco, Maize, Cigars, Hops, Buckwheat and Hemp. Canada.—Mr. May, of Montreal, showed samples of Corn and Grain. Denmark.—From the fat old Duchies of

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Holstein and Schleswig, there were large contributions of Butter, Flour, Grits, Beef, Hams, Pork, Rape seed, Rape seed cake, Linseed cake, Wool, Potatoes, Wheat, Rye, Flax, Cheese, Fodder and Lager Beer.

England had a few samples of Linconshire Wool, Kent Hops and Wheat. France showed a number of cases of Bordeaux-Cognac Pickles, Chocolate, Conserves and Eau de Cologne. Hamburg, of course, had an extensive miscellaneous show of Cheese, Wine, Smoked Beef, Fish, Sauces, Conserves, Sausages, Tobacco, Hops, Beeswax, Guano, Super Phosphate, Hams, Bacon, Pork, Mess Beef, Biscuits, Apples, and the largest variety of grass seeds (with living samples of grass) ever witnessed on exhibition. These were contributed by Ernst & Sprechleson, of Hamburg, the great German seedsmen. Hanover sent samples of Flax, Oakum, Tar, Gin, Graupin or Pearl Barley, Hops, Cheese, Butter, Peas, Fruit, and Wheat. Hesse Darmstadt furnished over fifty samples of Wine—fine Rhine Wine. The best houses in Bingen, Worms, Mainz, Weltenheim and Alsheim were represented. Holland was well represented in products of the dairy: such as butter and Cheese. Lubeck sent samples of Vinegar, Preserved Vegetables in cakes, and Medicines for cattle. Mecklenburg Schwerein produced samples of Rye, Peas, Flour, Bran, Rape cake, Linseed cake, Turnips, Silk, Cheese and Wool. From Nassau very fine samples of Wine were sent by Prince Metternich and Baron Zwierleind—Old Johannisburg. Prussia was also well represented in Seeds, Flax, Hops, Wheat flour, Tallow, Wool, Potatoes, Rape seed Oil, Oakum, Peas, Butter, Cheese, Sugar, Rhubarb Wine, &c. Russia brought samples of Wheat, Oats, Tares, Linseed and Linseed cake, Wool, Leather, Tallow, Butter, Schweizer Cheese, Rye, Turpentine, Sugared Fruit and Oil. Saxony exhibited samples of Honey, Wine, Fish, (cured,) Spirits, Fine Wools, Essential Oils and Spirits of Balsam. From Sweden, Cheese, Butter, Potatoes, Onions, Carrots, Wheat, Hay and Turpentine. From Switzerland, Cheese, Crystallized Milk and Cherry Cordial. United States of America.—Amongst the multitudinous preparations of cereal products submitted to public inspection at this Exhibition, the most novel, as well as the most useful, was "Duryea's Maizina," or Corn Flour, manufactured by the Glen Cove Company, Long Island, N. Y., from the purest pearl white American Corn. This article of food is so well known in the United States, it is unnecessary for me to animadvert upon its many good qualities as a cheap and highly nourishing food. I was delighted to see how rapidly it sold here. Its reputation is as great in England as at home. It was awarded a medal. James R. McDonald, Esq., late Vice Consul of the United States at Hamburg, had a medal presented to him for Bottled Fruit and Hops, from America. The same gentleman also took a medal for an American Cheese, weighing 950 lbs, and another medal for Baker's Super Phosphate. Hale and Parshall, of Lyons, New York, had a large bronze medal given for Peppermint Oil; and A. T. Stout & Co., of Pennsylvania, received a medal for Coal. B. H. Allen & Co., New York, a medal for Turkish Wheat; H. G. Hotchkiss, of Lyons, N. Y., a medal for Fancy Oils. We had also on exhibition, a large assortment of Petroleum Oil Lamps, with patent burners, ornamented with cut-glass globes, &c. These also carried a medal. Heavy and light Machinery for Agricultural purposes.—In this class the entries were very large—being near 3,000, and to give a description of the various articles, even of merit, would furnish material for a large volume. I shall therefore confine myself to that class of machinery of a useful and leading character. And let me state here that we were very indifferently represented in Agricultural Implements; and in Steam Machinery we had nothing. Those who wanted power had to rent it on the ground to show their machines in motion. The result was, our machinery was spread all over the inclosure. In Portable Steam Engines, there does not appear to be anything particularly new introduced, but it seems as though the attention of inventors had rather been directed to the more practical task of consolidating and improving their former inventions, rather than to produce novelties. The English mechanic deserves great credit in this respect, because, by this system of reproduction, he continually keeps before him the importance of economy, simplicity of construction, workmanship, and general excellence of material. The result of their efforts in this direction was abundantly evident in the machinery on exhibition at this show. Marshall's Improved Portable Steam

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Engines I have seen at work, and I assure you they work admirably. The prices are as follows, and I believe they could be, and are manufactured in the United States for less money:

6-horse power,			8½ inch cylinder		£ 195
8	"	"	9¾ "	"	220
10	"	"	10¾ "	"	260

With double cylinders, the prices are:

8-horse power,			6¾ inch cylinder		£ 246
10	"	"	7¼ "	"	280
12	"	"	8½ "	"	320

This firm had several other articles of Agricultural Machines on the ground, but nothing of especial worth to Americans, except this engine. Barrett, Exall & Andrews' Machinery, Agricultural Implements, Steam Engines, &c., attracted considerable attention. They had a large assortment, and received a gold medal on the whole. Their works are at Reading, in Berkshire, England. We next come to Clayton & Co.'s fine collection of Brick, Pipe and Tile Machines, Pugging, Crushing and Mortar Mills, Steam Engines &c. A most interesting, venerable and universal craft is that of brick-making; and various and romantic are the associations connected with it. The old manual process—slow, costly, and ineffective in its results, has long stood its ground amongst the contrivances connected with the building arts and the works of the architectural engineer, as an example of neglect in the midst of the great improvements which have signalized our times. But like many other fruits of intolerable prejudice, this rude system has now nearly gone out. Wherever the despotic monarch Steam succeeds in establishing his rule, there do we find that all crude, manual routine gradually disappears, or, at least, shrinks within the narrowest bounds. Steam has not yet mastered the work of the Farmer, but it has effected wonders, even in that comparatively unpromising sphere of action. In the operations of the builder, its effects are more directly palpable; particularly in the class of machinery it has been my privilege to witness at this Exhibition. Clayton's Combined Mechanical Temperer and Brick-Moulder, when worked by a 7-horse engine will produce 25,000 brick per day. In it, the pugging and moulding (and if necessary, the crushing, also,) are simultaneously carried out, and the moulded bricks are delivered in a continuously alternate stream from the two ends of the machine. The moulding and compressing orifices (formed with rollers,) through which the stream of clay is passed for shaping into the required brick-section, are of novel construction, or design—being contrived for turning out the clay with smooth faces on every side, and with clean, sharp edges. It is not an easy matter to express a mass of clay of fifty inches sectional area through a moulding orifice, so as to give sharp and fine edges, as the increased frictional action in the angles causes the edges to be roughened and torn. Clayton, however, has ingeniously removed this difficulty, by giving revolving sides to his die orifices, and therefore does not rely upon mere expression for giving form to the plastic mass. And above these die rollers is a water reservoir, from which branch supply pipes pass down to the working surface of the die, for lubrication. The bricks are turned out in such a state of stiffness as to bear walling up several bricks high, on leaving the moulding orifice. In this an enormous saving in drying space is obviously effected, as the necessity of flooring the bricks is entirely done away with. In a country like the United States, where labor is always expensive, machinery of this character is needed, and particularly in the immense prairie State of Illinois, whose building material must of necessity be principally brick, and the prospect of remuneration is the greater on this account, that I need hardly urge upon our mechanics the advantages offered in the construction of this class of machinery. The next thing of importance which took my attention was Clayton's Drain-Tile and Pipe Machines. It is unnecessary for me to add a single line in behalf of the advantages of drainage. The experience of the last half century has rapidly developed not only an improved system of drainage, but also improved means of agriculture, and taught the land-owner and farmer the invaluable lesson that wet land (whatever its component qualities,) must be effectually drained before its natural fertility can be developed, or before natural or artificial manures can be advantageously applied. By the instru-

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mentality of thorough drainage, almost magical changes have been effected everywhere. Barren lands have been converted into fertile fields, and rushy bogs into verdant meadows;

> "In reedy marsh and stagnant swamp,
> The bittern seeks his sedgy home,
> Till art and industry convert the scene,
> And golden corn—ripened by Summer's sun—
> Waves plenteous o'er the bosom of the earth.

The great increase and superiority of the produce which has invariably followed deep and effectual drainage have assured the most skeptical and timid of its inestimable value; and every agricultural improver is aware that until the aid of thorough draining be first invoked, all manures are wasted, the most useful agricultural implements are comparatively powerless, the sub-soil plow in vain seeks to bring into cultivation a latent virgin soil, and water irrigation itself, instead of becoming a source of wealth, would but spread wider desolation. Now, then, the introduction of machine-made pipe or cylindrical drain tiles into modern drainage is a most important era in agricultural improvement. It at once combines perfection with economy, as the previous enormous cost of tile drainage amounted to a virtual prohibition of its use. This prohibition, however, exists no longer. It is rescinded by the cheapness with which tiles are made by these machines. I recommend them to the notice of our machine makers, particularly as they are susceptible, in the hands of American mechanics, of considerable improvements, even yet. The next lot of machinery I have dotted down in my journal is that of Garrett & Sons, Leiston Iron works, Suffolk. The principal machine on exhibition by this firm was a Patent Locomotive Traction Engine. Of this class of steam engines there were several on the grounds, but this one took the first prize. The advantage it had over the others appeared to me to consist chiefly in its ⊤ shaped iron paddles, attached to the face of the driving wheels, which prevented its slipping in passing over soft ground. I hardly think it of much service in the United States. Avoling & Porter, of Rochester, England, had one also on exhibition. The rim of the driving-wheels had a plain surface, and slipped a good deal. I am told there are a number of these engines in use in England, and that they travel over the most hilly parts of the country, including inclines of 1 in 6; but from those I saw work here, I am inclined to doubt this statement. Price, 10-horse power, £420. Garrett & Son had also on exhibition an Improved Grain-dressing Machine, of which, as far as my experience serves, we in the west are very much in need of a good one. These machines are so constructed as to be adapted for dressing all kinds of grain and small seeds. It is fitted with spike rollers, adapted for dressing spring wheat when in very rough chaff, and it occurred to me as a very suitable dressing machine for the western farmer. The largest collection and variety of Plows on exhibition here, was to be found at the stand of Messrs. Ransome & Sims, of Ipswich, England, who showed some novelties in the way of Double and Gang Plows. One pattern was intended to be worked by one horse. It will turn a furrow 6x9 inches, and is adapted for a garden or orchard plow, or for turning up land between rows of vines, Indian corn, &c., in light prairie soil; and another will turn two furrows, 7x10 inches, and may be used with three or four horses. Price, £7. They also exhibited a Balance or Gang Plow, the material of which is iron, and is adjustable to different width of furrows. It is worked by a portable steam engine and windlass combined with a wire rope. I cannot furnish so full information of this apparatus as I would like, from the fact that I did not see it at work. It is certainly susceptible of great improvements, to adapt it for use on large western farms. From 7 to 10 acres per day is all that this steam plowing apparatus has accomplished hitherto. The price of the machinery, including engine, plows, grappling anchors and 1200 yards of steel rope, is £320. This firm exhibited also two Cotton Gins, "Macharty's Double-action" and the "Churka Gin." The State of Illinois having become a cotton-growing State, this class of machinery will be brought into requisition there. They had also on exhibition one of Sanford & Mallory's Flax Scutching Machines, which, from its simplicity of action and apparent efficiency, and the small amount of power required to drive it, struck me that it would prove a suitable machine for flax growers and dressers in the United States. Macharty's Cotton Gin.—This ma-

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chine is said to be the most efficient and practical one for the purpose, of any in use, but it is especially adapted for Sea Island or other long and medium staples. It will produce from 25 to 30 lbs of cleaned cotton per hour. They are much in use in Smyrna, Egypt and the Brazils. The power required is one horse for two gins, and the speed of the machine is 400 revolutions per minute. Gross weight, 9¼ cwt; total cost price for shipment, all complete, £ 25–13–0. The Churka Gin is for East India, or any of the descriptions of cotton having hard and smooth seeds. It will separate 10 lbs of cleaned cotton per hour, without injury to the fibre. One boy can attend to the feeding of four machines, and the requisite power is one horse to 6 gins. Weight, 5½ cwt; price packed ready for shipment, for steam power, £ 12–19–6, hand power gins, £ 15–10–0. The cylinder of Sanford & Mallory's Flax Scutcher is 20 inches diameter and the feed 26 inches. It can be worked by boys, as no skilled labor is requisite. The cylinder is composed of four iron rings, which sustains the teeth and scrapers, and the belt is of strips of leather, which cary the corresponding teeth, the open spaces allowing the boon or shove to fall through, whilst the tow is thrown out at the end. The flax scutched by this machine (some of which I saw,) is produced perfectly even and unbroken, with very clean ends. Two small boys will produce with this machine 100 lbs of clean flax per day. Motive power required is half a horse. Price, £33–15–0, delivered in London. The German and French mechanics had but little in the way of machinery calculated to attract an American's attention. They seem to copy English and American manufactures and implements, without improving the principal. Even in French Mill Stones, an English firm showed the largest and best sample of French Burrs. I will now give you a list of our American exhibitors, their machinery, and the prizes they have taken. First stands Cyrus H. McCormick, of Chicago, Illinois. A gold medal for the introduction and perfection of practical Mowing and Reaping Machines. This was the only gold medal given for this class of Agricultural Machinery. McCormick had two of his machines on the ground, one of which he presented to the Hamburg Agricultural Museum, at the close of the Exhibition. Seymour, Morgan & Co., of New York, received a silver medal for a first-class combined Reaper and Mower. Thompson & Avery, of Pennsylvania, a most economical Motive Power. James A. Saxton, Ohio, a large bronze medal for Ball's Combined Reaper and Mower. John Kelsey, of Yardleyville, Penn., a large bronze medal for a V shaped harrow. This harrow might be improved, by adding an axle-tree to the scraper, and wheels, so as to adapt it to light lands subject to twitch grass. The scraper would then be used on the fulcrum and lever principle for raising the harrow when choked with weeds. The harrow is a good one, but susceptible of improvement. Whittemore, Belcher & Co., Massachusetts, for an assortment of Agricultural Machinery and Implements, a large bronze medal. L. P. Rose, Michigan, large bronze medal for a case of highly finished Hay Forks, Hoes, Grubs, &c. E. C. Taintor, Massachusetts, a bronze medal for a Planing and Tenanting Machine. George Campbell, of Vermont, a large bronze medal for Willard's Patent Root-cutter. John Vanderbilt, New York, a large bronze medal for a collection of Agricultural Implements. John W. Free, of Indiana, a large bronze medal for a Fanning Mill. Hall & Spear, Pennsylvania, a bronze medal for a Plow. Solon P. Hubbell, New York, a large bronze medal for his Seed-sower. Contributions from the Shrubbery Garden, Hot-house and Orchard. I never saw at an exhibition of this kind, such an extensive collection of Plants, Flowers, Shrubs, Fruits and Vegetables; and nothing could surpass the beautiful manner in which they were arranged for exhibition. On leaving the outer inclosure, and passing through the portal, which opens into this department, the eye rests upon a scene of magic beauty. So magnificently beautiful is the transition from the prosaical machine and cattle shed to this bewitching Floral Court, surprise sits upon every countenance the moment he enters. And this is the principal resort of the ladies, whose gay apparel, happy smiles and merry laughter adds to the beauty and attraction of the spot. The day of opening was an exclusive occasion. The price of entrance being four thalers, none but the wealthy were present. On that day, I will venture this Floral Court was the gayest spot in Europe. It was remarked to me by several American gentlemen present, that they had never seen so much beauty gathered together on one oc-

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casion before in their lives. To the right of this court, on entering, there was the finest display of Bedding Geraniums, from the gardens of Ernst Von Sprechelson, of Hamburg, I ever witnessed, the flowers of which were fully expanded. These, and a vast collection of Verbenas, Fuchias, Petunias, Calceolarias and Achimenes, occupied nearly the whole of the right wing of the Floral Department. On the left were a large variety of British and other Ferns, which, for a decorative plant, are very much admired in parterre and terrace ornamentation. There was also a fine collection of Roses, Dahlias, Gloxinias and variegated plants. Shrubs, Evergreens an Creepers, altogether so numerous and beautiful, that to do justise to the whole would occupy a larger space in my report than I have time to enumerate. In the centre was a small lake, surrounded by ornamentad pillars, on which were mounted Shrubs, Ferns and Palms, and from the bosom of the lake sprung an elaborately carved fountain, which, when playing in the sunshine, gave a beautiful effect to the whole scene. Behind the two wings of the Floral Court, fronting to the north and south, was the Fruit and Vegetable Departments. In the Vegetable Class, there were Winter and Spring Onions, Eschalots, Turnips, Carrots, Radishes, several varieties of Beans and Peas, Artichokes, Parsnips, Cucumbers, Cos Lettuce, Cabbage Lettuce, Rhubarb, Cabbage, Cole, Cauliflower, Red and White Round Potatoes, Kidney Potatoes, Beets, and an infinite number of Herbs, &c., &c. In Fruits, there were Apples, Pears, Plums, Pines, Apricots, Peaches, Nectarines, Grapes—several varieties, Gooseberries, Strawberries, Raspberries, Black Currants, Red Currants, White Currants, Cherries, Cranberries, Blueberries, &c., &c. All of which were very fine, particularly the Gooseberries, Raspberries and Black, Red and White Currants. I do not believe they could be surpassed by any country for size and flavor. I can certainly recommend this part of Germany, particularly Holstein, to import young stocks from.

In concluding my report of this Exhibition, I would present my thanks to those gentlemen of the Executive Committee of this Great Exhibition, for their uniform kindness and attention to our wants. Their readiness, on all occasions, to aid our efforts in obtaining space, convenient positions, and all the other accomodations incident to both commissioners and exhibitors, deserve our greatest praise. If this report be published, I beg to be allowed the honor of presenting a copy of it to each of the said Committee.

W. MARSH, *Commissioner.*

ACKNOWLEDGMENTS.

We cannot too strongly express our gratitude to the Press of the State for their services in aid of the efforts of the Society to promote and advance the industrial interests of the State. At our annual fairs, trials of implements, and meetings of the Executive Board, we have been pleased to welcome and to recognize the value of the labors of their intelligent and industrious reporters.

To the railroad companies of the State we also tender our thanks for their many acts of substantial service to the cause in which we have been engaged.

LIBRARY.

From nothing, in 1860, this has gradually increased, with trifling cost to the Society, until it includes copies of printed Transactions of most other State Societies, full sets of the Prairie Farmer and Country Gentleman, and some forty volumes of miscellaneous works.

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TREASURER'S REPORTS FOR 1861, 1862, 1863 AND 1864.

1861.—*Illinois State Agricultural Society,* *In acc't with* JOHN W. BUNN, *Treasurer.*

By amount received from State	$3,000 00	
" " " at Chicago Fair	9,976 50	
" " " of G. W. Gage, rent of grounds	1,000 00	
" " " " " " amphitheatre, &c	848 06	$14,824 56
To balance, as per last report	$ 670 88	
" amount paid Premiums on Farms, &c., 1861	800 00	
" " " " at Chicago Fair	3,486 50	
" " " Expenses before Fair	1,837 02	
" " " " for Chicago Fair	6,246 73	
" " " for Printing and Advertising	1,215 36	
" balance	568 07	$14,824 56
By balance	568 07	

JOHN W. BUNN, *Treasurer.*

1862.—*Illinois State Agricultural Society,* *In acc't with* JOHN W. BUNN, *Treasurer.*

By balance	$ 568 07	
" amount received from State	3,000 00	
" " Entry fees at Reaper Trial	1,035 00	
" " received for Membership Tickets	16 00	
" " Subscriptions, &c	217 00	
" balance due John W. Bunn	849 73	$5,685 80
To amount paid Premiums on Farms, &c	$ 590 50	
" " " at Reaper Trial	225 00	
" " " Expenses at do	587 35	
" " " for printing Journal	1,508 74	
" " " Expenses	2,774 21	$5,685 80
To balance due John W. Bunn	$849 73	

JOHN W. BUNN, *Treasurer.*

1863.—*Illinois State Agricultural Society,* *In acc't with* JOHN W. BUNN, *Treasurer.*

By amount received from State	$3,000 00	
" " " Agricultural Implements Trial	295 00	
" " " at Decatur Fair	9,641 70	
" " " from Macon Co. Ag. Soc'y for rent of grounds &c	2,000 00	
" " " " " " acc't of Citizens' Prizes	315 00	$15,251 70
To balance due John W. Bunn	$ 849 73	
" amount paid Premiums at Decatur Fair	4,862 00	
" " " for Printing and Advertising	1,202 95	
" " " " Stationery and postage	257 46	
" " " " Sundry expenses	6,046 45	
" balance	2,033 11	$15,251 70
By balance	2,033 11	

JOHN W. BUNN, *Treasurer.*

1864.—*Illinois State Agricultural Society,* *In acc't with* JOHN W. BUNN, *Treasurer.*

By balance	$2,033 11	
" amount received from State	3,000 00	
" " " for old papers sold	33 45	
" " " at Decatur Fair	15,678 26	
" " " of Macon Co. Ag. Soc'y for rent of grounds, &c	2,000 00	
" " " " " " acc't of Citizens' Prizes	690 00	$23,434 82
To amount paid Premiums	$8,145 58	
" " " for Printing and Advertising	1,422 25	
" " " " Stationery and postage	205 34	
" " " " Sundry expenses	3,347 57	
" balance	5,314 08	$23,434 82
By balance	$5,314 08	

JOHN W. BUNN, *Treasurer.*

All of which is respectfully submitted,

For the Executive Board,

JOHN P. REYNOLDS, *Corresp'g Sec'y.*

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PROCEEDINGS OF EXECUTIVE COMMITTEE.

ILLINOIS STATE AGRICULTURAL ROOMS,
Springfield, Jan. 14, 1861.

The Executive Committee of the Illinois State Agricultural Society met, as above, in accordance with the constitution.

Present—President Van Epps, Ex-President Ellsworth and Vice Presidents Denio, Mattson, Holder, Whiting, Singleton, McConnell, Kile, Ozburn; also, John P. Reynolds, Corresponding Secretary, John W. Bunn, Treasurer, and John Cook, Recording Secretary.

President Van Epps, having been escorted to the chair, proceeded to address the Committee as follows:

Gentlemen, and Fellow Members of the State Board of Agriculture:

Custom seems to have established the precedent—and perhaps properly so—that at the first meeting of this, or other like organizations, suggestions by the presiding officer for their future guidance and action should be shadowed forth, if ever so briefly.

Should I deviate from such custom in this instance, it will be from the fact that quite a portion of those of experience, of long standing, tried in the early days of the workings of this Society, still remain and act with us, upon whose good judgment we can depend, and upon whom we may confidently rely in all emergencies that may arise.

I am happy to have this early opportunity of saying to you in this public manner, that the agricultural community and the State at large owe a debt of gratitude to the retiring presiding officer of this Society (Lewis Ellsworth) for his untiring devotion to the interests he has so ably and industriously looked after, and especially during the last two years.

Should an equal amount of application and skill be exercised for the ensuing like term, for one I shall be more than satisfied.

In conducting the affairs of an association of this character, it is quite difficult to mark out a settled course of policy that can be pursued at all times and under all circumstances without deviation.

The times, exigencies and locality of any given exhibition of this Society bring new demands from year to year that must be met. We are emphatically a progressive people.

Illinois, embracing an area of about 60,000 square miles, and extending through quite six degrees of latitude, a vast teeming garden that is being rapidly developed, opens up a field more than sufficient for the energies of her two millions of people. For us, then, there is room sufficient for the exercise of all our feeble powers. Let us not, therefore, lose sight of those things that immediately concern us as a Society whose mission and sole object should be to thoroughly disseminate agricultural intelligence throughout our entire borders, and in every possible way to do the greatest good to the greatest number.

While an enterprising people of a neighboring city put forth commendable and extraordinary efforts to adapt themselves to the wants of the citizens of this and other States in their annual exhibitions of Agriculture and Mechanic arts, shall we not in the midst of this vast domain "flowing with milk and honey," boundless in resources, the garden of the world, prepare a feast of fat things—a day of jubilee, inaugurate a premium list worthy of, and that shall command the hearty co-operation of every son and daughter of Illinois, from Cairo to Dunleith, from the lakes to the Mississippi, build up and establish the days of recreation and relaxation from toil, that our annual State gathering may be second to none in America?

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After which he briefly touched upon the following heads:

First—Particularly referring to and recommending short daily lectures on the Fair Grounds, not occupying more than half an hour, on subjects of Agricultural Education, by different persons, during the progress of the Fair.

Second—Calling attention to the extended and valuable report of the Farm Committee, for the year 1860.

Third—The recent plans and steps taken to augment the Agricultural Library and establish at the Capital an Agricultural Museum.

Fourth—Referring in warm terms to the State Horticultural Society, and the enthusiasm and mental feast enjoyed recently at the city of Bloomington.

Fifth—Especially inviting and extending a cordial welcome to the Agricultural Press of the State to attend the meetings of the Board, and to the entire press of our own and adjoining states to be present at our Annual Fairs.

Sixth—Exhorting the members of the Board to so systematize and properly advertise their respective districts, as to reach all persons.

Seventh—Submitting rules for the order of business, during the deliberations of the Executive Committee.

Eighth—Asking the indulgence of the Committee for any want of fitness in the administration of its affairs, thanking them courteously for their attention, etc.

On motion of Mr. Ozburn, the foregoing address was ordered to be spread upon the records of the Society.

On motion of Mr. Ozburn, a committee of three, consisting of Messrs. Holder, Kile and the Corresponding Secretary, was appointed to frame a code of by-laws for the future government of the Executive Committee.

Said committee, having had the subject under consideration, presented the following as their report:

CODE OF BY-LAWS.

First—
Roll call.
Reading minutes of preceding meeting.
Report of committees.
Presentation of petitions.
Unfinished business.
New business.
Resolutions, miscellaneous, etc.

Second—Meetings of the Executive Committee of the Illinois State Agricultural Society may be held upon call of the President, or any two Vice Presidents, previous notice in writing having been given to each member of the Executive Committee.

Third—Cash premiums of the Society shall be paid by the Treasurer on checks drawn by the Corresponding Secretary upon him, which said checks when paid shall be the Treasurer's voucher for the same.

Fourth—The Corresponding Secretary shall receive as compensation for his services One Thousand Dollars per annum.

Fifth—The Treasurer shall receive as compensation for his services two per cent. upon the amount of moneys received by him.

Sixth—The Recording Secretary shall receive as compensation for his services, three dollars per day while employed.

Seventh—The necessary expenses of the Executive Committee and officers in attending the meetings of the Society and Committee, shall be paid out of the Treasury.

On motion of Mr. Ozburn, the whole was unanimously adopted.

By permission, Dr. Kile addressed the Committee upon the subject of premiums, showing the inequality of the amounts offered in premiums, and recommended the matter to the consideration of the Committee.

By permission, Dr. Evans addressed the Committee upon an

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Agricultural and Botanical Survey of the State, presenting a preamble and series of resolutions.

On motion of Mr. Ellsworth, the preamble and resolutions were referred to a Committee of three, consisting of President Van Epps, Messrs. Kile and Wait.

On motion of Dr. Kile, Ex-President Brown was re-appointed Special Committee on Pleuro Pneumonia.

On motion, the Executive Committee resolved itself into a Committee of the Whole, on the subject of the Premium List for 1861,—Ex-President Ellsworth in the chair.

After a protracted sitting upon the subject, the Committee arose, reported progress, and asked leave to sit again.

Adjourned until 2, P. M.

Two o'clock, P. M.

The Executive Committee met, pursuant to adjournment.

President Van Epps in the chair, and members present as before.

The Board resolved itself into a Committee of the Whole, on Premium List, Ex-President Ellsworth in the chair.

After a lengthy discussion of the subject, the Committee again arose, reported progress, and asked leave to sit again.

Adjourned until 7, P. M.

Seven o'clock, P. M.

The Executive Committee met, pursuant to adjournment.

President in the chair, and members present as before.

The Board again resolved itself into a Committee of the Whole, on the Premium List, Ex-President Ellsworth in the chair.

After again discussing the subject, the Committee arose, reported progress, and asked leave to sit again.

Adjourned until 10, A. M., to-morrow.

January 15, 1861.

The Executive Committee met, pursuant to adjournment.

President in the chair and members present as before.

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The Board resolved itself into a Committee of the Whole, on Premium List, Ex-President Ellsworth in the chair.

The Committee, having concluded its labors on the Premium List for 1861, rose, reported finally, and asked to be discharged.

President Van Epps in the chair.

On motion of Mr. Ellsworth,

Resolved, That the report of the Committee of the Whole on Premium List be published and the same when published become part of the records of the Society.

On motion, adjourned until 2, P. M.

Two o'clock, P. M.

Pursuant to adjournment, the Executive Committee met.

President in the chair, and members present as before.

On motion of Dr. Kile, the subject of plans, specifications and requirements, to be complied with by the successful applicant for holding the next State Fair, was discussed, and, having been agreed on, was ordered to be published.

On motion of Mr. Ellsworth,

Resolved, That the same, when subscribed to by the successful applicant, shall be filed with the papers of the Society, in the hands of the Recording Secretary.

Dr. Kile, chairman of Special Committee, to which was referred the communication of Dr. Evans, of Cook county, asking for an Agricultural and Botanical Survey of the State, reported the same back, and recommended the co-operation of the Society in the premises.

On motion, the report was received and adopted.

On motion, adjourned until 7, P. M.

Seven o'clock, P. M.

The Executive Committee met, pursuant to adjournment.

Present, as before.

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The City of Chicago, having received a majority of all the votes cast, on motion, the Committee proceeded to ballot for choice of location in that city—there being two applicants from said city. The result was as follows: Messrs. Gage, and others, 9 votes; Messrs. Boyington, and others, 1 vote.

Messrs. Gage, and others, having received a majority upon their proposition, the Annual Exhibition of 1861 was accordingly awarded.

On motion of Dr. Kile, President Van Epps and Ex-President Ellsworth were appointed a special committee to draft contract for holding the next State Fair.

On motion of Mr. Ellsworth,

Resolved, That the Executive Board of the Illinois State, Agricultural Society recommend that the Legislature now in session appropriate one hundred dollars ($100) for each legally organized County Agricultural Society in the State, payable annually.

A petition from the President and Directors of the Macoupin County Agricultural Society, asking the co-operation of this Board in urging the passage of an act by the Legislature for the permanent location of the State Fair, and the prevention of male animals from running at large, was, on motion of Mr. Denio, laid on the table.

On motion of Mr. Ellsworth, the Corresponding Secretary was instructed to inform the petitioners of this action of the Board.

On motion of Mr. Holder,

Resolved, That the name of the owner of stock or articles for exhibition be required to be placed upon the exhibition cards of the exhibitor.

On motion of Mr. Ellsworth,

Resolved, That the sum of twenty-five dollars ($25) be appropriated for the subscription to Agricultural and Mechanical papers, for the use of the Board, the same to be filed in the Agricultural Rooms.

Resolved, That the Executive Board, the Corresponding Secretary, the Recording Secretary and the Treasurer be allowed five Stock and Agricultural Journals, for the ensuing two years the same to be paid for out of the funds of the Society.

Adjourned until 9, A. M., to-morrow.

January 16, 1861.

The Executive Committee met, pursuant to adjournment. President in the chair, and members present as before.

On motion of Dr. Kile,

Resolved, That this Board, feeling that our interests are strongly connected with the Mechanic Arts of this State, cordially invite, through the President, Mr. Boyington, the Mechanics' Institute of Chicago to co-operate in our next Annual Exhibition at Chicago.

On motion of Mr. McConnell,

Resolved, That the resolution requiring that the name of the owner to be affixed to the exhibitor's card, be rescinded.

Whereupon the following resolutions, offered by Dr. Kile, were unanimously adopted:

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Resolved, That the exhibitors of stock shall be required to attach to the stall or pen of animals on exhibition a placard, setting forth the name of the animal, together with the blood and breed, and the exhibitor's address.

Resolved, That all owners of articles on exhibition be required to place the name of the owner or manufacturer upon a card attached to the articles exhibited.

Mr. Denio offered the following:

Resolved, That no aged animals receiving first premiums at the exhibition of 1860 of the Illinois State Agricultural Society shall be allowed to compete for premiums at the exhibition of 1861, except in herds and sweepstakes.

Mr. McConnell moved, as an amendment, that this resolution shall relate only to cattle.

The resolution, as amended, was adopted.

On motion of Mr. Mattson,

Resolved, That the President and Ex-President Ellsworth be and are hereby constituted a committee, to confer with the President and Directors of the Gardeners' Association of Chicago, and especially invite their hearty co-operation at our next Annual Fair; and that said Committee have power to change the premium list, with reference thereto, as they shall deem proper, and for the best interests of the Society.

Dr. Kile offered the following:

Resolved, That this Society appropriate to the special committee, above named, the sum of three hundred dollars ($300,) to be expended in special premiums to the Gardeners' Association.

Laid on the table.

Mr. Ellsworth asked to be excused from serving on the committee of conference with the Gardener's Association.

The Board refused to excuse him.

On motion, adjourned until 2, P. M.

Two o'clock, P. M.

Pursuant to adjournment, the Executive Committee met.

The President in the chair, and members present as before.

Mr. Denio presented the following communication; which, on motion, was received, and ordered to be spread upon the records of the Society:

SPRINGFIELD, ILLS., *January* 16, 1861.

To the Executive Board of the Illinois State Agricultural Society:

GENTLEMEN: It affords me pleasure to extend to you a cordial invitation, on behalf of the Board of Education of the State of Illinois, to attend the dedication of the Normal University, near Bloomington, on the 24th inst. We sincerely hope circumstances will permit you all to attend.

Your obedient servant,

S. W. MOULTON, *President.*

On motion, the Corresponding Secretary was instructed to inform President Moulton that his very kind invitation had been accepted by the Executive Committee, and to tender therewith the grateful acknowledgments of the Committee.

President Van Epps introduced the following resolution, which was adopted:

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Resolved, That a premium of one hundred dollars be offered by the Illinois State Agricultural Society for any new and valuable implement that shall rapidly turn over or convert the soil into a suitable condition to propagate a crop, at less expense than by ordinary plowing, either by animal or steam power—the Executive Committee to be the awarding committee.

On motion,

Resolved, That single admission tickets be used for the admission of visitors and members of the State Agricultural Society, at the exhibition in the fall of 1861.

On motion, the President was appointed a Special Committee, to confer with Mr. Gage upon the arrangement of the contract for the transfer of the ampitheater, together with the proceeds arising from the same.

Adjourned until 7, P. M.

Seven o'clock, P. M.

The Executive Committee met, pursuant to adjournment.

President in the chair, and members present as before.

The President presented a verbal report of the contract to be made with Mr. Gage, in accordance with resolution; which was received, approved and ordered, when consummated, to be filed with the papers of the Society.

On motion, the President was instructed to procure suitable metallic badges for the Executive Committee, the Board of Counsellors, the Corresponding Secretary, the Recording Secretary, and the Treasurer.

Adjourned until 9, A. M., to-morrow.

January 17, 1861.

The Executive Committee met, pursuant to adjournment.

President in the chair, and members present as before.

On motion, the Committee proceeded to the election of General Superintendent of the Grounds, and Superintendents of the various Departments of the Society, for the Fair of 1861, with the following result:

General Superintendent	WILLIAM BUTLER, Lee county.
Superintendent Class A	R. H. WHITING.
" " B	JAMES W. SINGLETON.
" " C, D and E	A. B. MCCONNELL.
" " F	WILLIAM KILE.
" " G	H. S. OSBURN.
" " H	WILLIAM S. WAIT and JOHN A. KENNICOTT.
" " I	C. B. DENIO.
" " K	A. J. MATTSON.
" " L	R. H. HOLDER.
" " M	S. H. ELLIOTT.

On motion, adjourned until 2, P. M.

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Two o'clock, P. M.

The Executive Committee met, pursuant to adjournment.

The Premium List, together with the rules for the government of the next Annual Exhibition of the Society, was again taken up, and, on motion, approved and ordered, when published, to become part of the records of the Society.

On motion,

Resolved, That the next Annual Exhibition and Fair of the Illinois State Agricultural Society shall be held at or near the City of Chicago, commencing on the 9th day of September next, and continue six days.

On motion,

Resolved, That unless otherwise provided, the awarding committees, at the next Annual Exhibition of the Society, shall consist of five members, three of whom shall constitute a quorum, and be fully authorized to make awards.

On motion, adjourned until 7, P. M.

Seven o'clock, P. M.

Pursuant to adjournment, the Committee met.

President in the chair, and members present as before.

On motion, the Committee proceeded to the appointment of committees in the various Departments.

Without having completed this work, the Executive Committee, at a late hour, adjourned until 9, A. M., to-morrow.

January 18, 1861.

Executive Committee met, pursuant to adjournment.

President in the chair, and members present as before.

The unfinished business of the preceding evening was taken up.

The committees having been fully made up, it was, on motion,

Resolved, That these committees be embraced in and published with the Premium List and Rules and Regulations for the next Fair.

On motion of Dr. Kile, a committee of three, consisting of President Van Epps, Ex-President Ellsworth and Gen. Singleton, was appointed to confer with the Chicago committee in relation to awards of premiums in the citizens' prizes, as embraced in contract with Messrs. Gage & Co., for holding next State Fair.

On motion of Mr. Ellsworth, Dr. Kile was added to the committee.

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On motion, the President, Corresponding Secretary and the Treasurer were appointed a Committee on Printing for the year 1861.

On motion of Dr. Kile,

Resolved, That fifteen hundred complimentary cards to the Exhibition and Fair of 1861, be procured by the Recording Secretary, signed by him, and then placed in the hands of the President, to be countersigned by him, and an account of the disbursement of the same to be rendered the Board at the January meeting in 1862.

Ex-President Ellsworth offered the following preamble and resolution:

WHEREAS, At a Convention of the officers of certain Railroad Companies held at Chicago on the 20th day of December, 1860, a resolution was passed having reference to carrying freight and passengers to and from the Annual Fairs of this Society, by the terms of which, those roads terminating at the place of holding such Fairs, may, at their option, vary the general rate on that subject; therefore,

Resolved, That the President of this Society be appointed a committee to confer with the proper officers of the Railroads leading into Chicago, and to obtain from them the most favorable arrangement possible for the Fair of 1861.

On motion, adopted.

On motion of Mr. Holder,

Resolved, That whilst Disunion and Secession are abroad in the land, threatening the destruction of our glorious institutions, it is gratifying to see that a strong Union feeling has existed in and characterized the action of this Board; also,

Resolved, That the President and Directors of the Illinois State Horticultural Society be cordially invited to co-operate with us in our next Annual Exhibition and Fair.

On motion, the Board adjourned, *sine die*.

TREMONT HOUSE, CHICAGO,
June 4, 1861—1, P. M.

The Executive Committee of the Illinois State Agricultural Society, together with the Board of Counselors of the same, met at the Tremont House, Chicago, pursuant to the call of the President.

President Van Epps in the chair.

Members present, as follows: Ex-President, James N. Brown; Vice Presidents, A. J. Mattson, R. H. Holder, R. H. Whiting, A. B. McConnell, W. S. Wait, Wm. Kile; John P. Reynolds, Corresponding Secretary.

On motion of Dr. Kile,

John P. Reynolds was appointed Recording Secretary, *pro tem.*

The decease of our fellow-citizen, Hon. Stephen A. Douglas being announced, John P. Reynolds offered the following resolutions, which were unanimously adopted:

Resolved, That in the death of our distinguished fellow-citizen, Hon. Stephen A. Douglas, the industrial classes have lost a valued friend and co-laborer.

That in him we recognize a statesman, whose life and history present a glorious illustration of the practical working of our free institutions in opening to private industry, worth and virtue, every avenue to public honor.

That we deeply sympathize with the members of his family and the circle of his immediate friends and relations in their sad bereavement, and hereby tender to them our sincere condolence in their affliction.

That we feel we but give expression to the unanimous desire of the people of the State

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of Illinois, in asking that, as his entire manhood has been spent among us and in our service, his last resting place may be at our State capital.

WM. H. VAN EPPS, Pres't Illinois State Agricultural Society.
LEWIS ELLSWORTH, Ex-Pres't Ill. State Agricultural Society.
JOHN A. KENNICOTT, Pres't Illinois State Horticultural Society.
JAMES N. BROWN, Ex-Pres't Ill. State Agricultural Society.
H. C. JOHNS, " " " " "
C. W. WEBSTER, " " " " "
C. B. DENIO, Vice President 1st District.
A. J. MATTSON, " 2d "
R. H. HOLDER, " 3d "
R. H. WHITING, " 4th "
J. W. SINGLETON, " 5th "
A. B. McCONNELL, " 6th "
WM. KILE, " 7th "
W. S. WAIT, " 8th "
H. S. OZBURN, " 9th "

JOHN P. REYNOLDS,
Corresponding Secretary State Agricultural Society.

The Chair appointed James N. Brown, W. S. Wait and William Kile, a committee to wait upon the other committees, now in session in Chicago, and present to them and to Mrs. Douglas a copy of the foregoing resolutions.

The Committee, thereupon, retired, and, after a time returning, reported that they had performed their duty, and that Mrs. Douglas had consented that the remains of her husband should be interred in the State of Illinois.

The President made a statement as to the objects contemplated in calling the Executive Committee together at this time and place, after which the committee adjourned to meet again at 2:30, P. M.

Half-past Two o'clock, P. M.

Committee met, pursuant to adjournment.

Present as before, and Lewis Ellsworth.

Mr. Mattson offered the following resolution, which was unanimously adopted:

Resolved, That Wm. H. Van Epps, Captain James N. Brown, Dr. Kile, W. S. Wait and Lewis Ellsworth, be and they are hereby appointed a committee to forthwith wait upon the managers of the various railroads concentrating in Chicago, and obtain, if possible, passes for the members of this Board over said roads for the current year; and, failing in that, to make the best possible arrangement for trip passes to business meetings of the Board.

The President made a verbal report as to the negotiations with Mr. Gage, and the present condition of the arrangements for holding the State Fair.

Mr. McConnell offered the following resolutions, which were adopted:

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buildings be and they are hereby empowered to make such alterations and modifications, within the limits of the contracts with Mr. Gage, as to them may seem necessary and proper.

Adjourned to meet to-morrow at 8, A. M.

June 5, 1861.

The Committee met pursuant to adjournment. Same members present as on yesterday.

The Committee proceeded to Brighton in carriages, and returned and met again at 2, P. M.

The following resolution was unanimously adopted:

Resolved, That, having this day, in full Board, visited and carefully examined the grounds at Brighton, heretofore selected by a committee of this Society, on which to hold the Annual Exhibition for 1861, and having well considered their location, accessibility and other advantages, we fully approve of the selection, and will proceed to complete the arrangements for such exhibition, with entire confidence that it will prove an eminent success.

On motion, the Executive Committee adjourned, *sine die.*

FAIR GROUNDS, CHICAGO,
September 9, 1861—5, *P. M.*

The Executive Committee of the Illinois State Agricultural Society met at the President's office, Fair Grounds, Chicago, pursuant to a call of the President.

President Van Epps in the chair.

Members present, as follows: Lewis Ellsworth, R. H. Holder, James W. Singleton, A. B. McConnell.

John Cook, Recording Secretary, being absent, on motion, John P. Reynolds was appointed Recording Secretary, *pro tem.*

On motion,

Resolved, That the programme presented by Gen. Singleton for Tuesday's proceedings on the Fair Grounds, be unanimously adopted:

Resolved, That Mr. Russell be permitted to send off balloons inside of the Fair Grounds, at the point designated in his application.

Resolved, That R. H. Whiting, James W. Singleton and John P. Reynolds, be appointed a committee to make up and report to the Executive Committee, every day at 10, A. M., a programme for the succeeding day, commencing on Tuesday the 10th inst.

Resolved, That Mr. J. S. Case be permitted to erect and to walk upon a wire between the pagoda and the amphitheater, in accordance to the proposition to that effect.

On motion, adjourned.

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TREMONT HOUSE, CHICAGO,
September 11, 1861.

A special meeting of the Executive Committee was held at the Tremont House.

President Van Epps in the chair.

A. J. Mattson was appointed Secretary, *pro tem.*

On motion of Mr. Ellsworth,

Resolved, That a committee be appointed to confer with the Superintendents of the different railroads running into this city, in regard to extension of the time of return tickets, and report forthwith.

Resolved, That the Executive Committee meet at half past 8 o'clock, P. M., punctually, every day at the President's office.

On motion of Mr. Holder,

Resolved, That Dr. Kile, A. J. Mattson and Col. Capron, be appointed a committee to wait upon Major Coolredge on the Fair Grounds, in relation to the military examination, &c., &c.

On motion, adjourned.

TREMONT HOUSE, CHICAGO,
September 13, 1861—8, *P. M.*

The Executive Committee met, President Van Epps in the chair.

Members present, as follows: Ex-Presidents Brown, Webster and Ellsworth; and Vice Presidents McConnell, Singleton, Kile, Ozburn, Wait, Mattson and Holder.

In the absence of John Cook, the Recording Secretary, John P. Reynolds was appointed Secretary, *pro tem.*

Mr. Ellsworth made a statement in relation to the herd of Devon cattle, belonging to Mr. Lock, from London, Canada West, to the effect that Mr. Lock desired the Executive Committee to make a commendatory notice of this herd, because they were, as claimed by him to be, pure Devons; but not being Herd Book animals, they were refused premiums or consideration in making the awards.

Mr. Whiting made a statement confirming the facts presented by Mr. Ellsworth.

On motion of Mr. Whiting,

Resolved, That the Executive Committee commend the herd of Devon cattle presented for exhibition at the Fair of this Society, by Mr. Wm. H. Lock, from London, Canada West, as worthy individual animals, but as necessarily excluded from competition in the regular list of premiums, by reason of the rule of the Society requiring pedigrees of all animals in the lot to which they belong.

On motion of Mr. Ellsworth,

Resolved, That the Superintendents of departments are hereby instructed not to return the awarding committee's books in their respective departments, to the Corresponding Secretary, until the close of the Fair; or until required to do so by resolution of the Executive Committee.

On motion, adjourned.

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TREMONT HOUSE, CHICAGO,
September 15, 1861—8 P. M.

The Executive Committee met,

President Van Epps in the chair.

In the absence of John Cook, the Recording Secretary, Cyrus W. Webster was appointed Secretary, *pro tem.*

On motion, the following preamble and resolutions were unanimously adopted:

WHEREAS, By a recent act of Congress, provision has been made for the appointment of a commissioner or commissioners, to represent the United States at the great exhibition of the industry of all nations, to be held at London, in the year 1862; and,

WHEREAS, The representation of this country at similar exhibitions, has hitherto been accorded to the States East of the Valley of the Mississippi; and,

WHEREAS, The Northwest, embracing an area of nearly four hundred square miles, containing a population of over six millions, and producing more than one-half of the grain grown in the whole Union; by virtue of the vastness of its resources, the extent of its population, and the degree of its industrial developments, is fairly entitled to the next representation at the said World's Exhibition, or, if several commissioners be appointed, to at least one of the number; therefore,

Resolved, by the Illinois State Agricultural Society, That his Excellency, the President of the United States, is hereby respectfully requested to appoint the said commissioner or one of said commissioners, from this important division of the country.

Resolved, That in the person of Dr. John W. Hoyt, Secretary of the Wisconsin State Agricultural Society, the industry of the West and the whole country has a worthy and able exponent, who would efficiently and honorably represent the United States at said exhibition, and that his appointment as said commissioner, or as one of said commissioners authorized by the act of Congress herein referred to, is, therefore, respectfully and earnestly solicited by this Society.

On motion,

Resolved, That in consequence of the rain and bad weather, the exhibition of fire arms be postponed until the morning of the 17th inst.

Adjourned.

FAIR GROUNDS, CHICAGO, PRESIDENT'S OFFICE,
September 16, 1861.

President Van Epps in the chair.

On motion of Dr. Kile,

Resolved, That the Corresponding Secretary be and he is hereby instructed and required to make out and deliver, on application, to those entitled to them, checks for fifty per cent. on the premiums awarded, as shown by the books of the awarding committees.

Resolved, That exhibitors be notified that they may, at their option, withdraw the animals or articles they may respectively have on exhibition, on obtaining the permission of the Superintendent of the Department in which their animals or articles may be exhibited.

On motion, adjourned.

ROOMS OF THE ILLINOIS STATE AGRICULTURAL SOCIETY,
SPRINGFIELD, *January* 7, 1862.

Pursuant to a call of the President, the Executive Committee met, and was called to order at 9 A. M.

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On calling the roll, it being found that a quorum was not present, on motion, adjourned until 9 A. M., to-morrow.

January 8, 1862.

The Executive Committee met pursuant to adjournment,

President Van Epps in the chair.

Present, as follows: Lewis Ellsworth, A. B. McConnell, James W. Singleton, W. S. Wait, H. S. Ozburn, of the Executive Committee, and James N. Brown, of the Board of Counselors.

On motion of Mr. McConnell,

The Recording Secretary, John Cook, being absent in the military service of the country, John P. Reynolds was appointed Recording Secretary during the absence of Mr. Cook.

President Van Epps made a statement of the satisfactory settlement of all matters in Chicago, growing out of the holding of the late State Fair at that place. Every bill which had come to his notice had been paid.

He also reported as to the disposition he had made of the complimentary tickets issued for the last Fair. Report regarded as entirely satisfactory.

The Corresponding Secretary presented and read a communication from W. C. Flagg, Esq., of Moro, Madison county, calling attention to the subject of a Farmers' Convention for 1862, and suggesting that the Executive Committee of the Society call such a convention.

The Secretary stated that he had had much correspondence with gentlemen in different parts of the State on the subject, and that much interest was manifested.

The communication was referred to a committee, consisting of James N. Brown, Chairman, A. B. McConnell, Lewis Ellsworth, and John P. Reynolds.

The Corresponding Secretary also presented a communication from Robert W. Eddison, now of Philadelphia, and recently of England, as agent for Fowler's Steam Plowing Machinery, asking that the Society appoint a committee to witness and report upon a trial of that implement, which is expected to be made this coming spring somewhere in Central Illinois.

Whereupon the following committee was appointed:

Wm. H. Van Epps, Chairman, James N. Brown, H. C. Johns, C. W. Webster, and Lewis Ellsworth.

On motion of Mr. Ellsworth,

The Treasurer was requested to make a statement of the present condition of the finances of the Society.

Communications were received from Mr. Horace Capron, of Peo-

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ria, Messrs. Peter Sweat and H. I. Chase, being present as delegates from that city, and from Mr. A. Duffield, of Sandoval, on the subject of holding the next Fair.

The Secretary stated he had received letters from gentlemen in Chicago on the same subject, and had also been informed that citizens of Belleville intended making application.

On motion, adjourned until 2 P. M.

Two o'clock, P. M.

The Committee met, pursuant to adjournment.

Present, as before.

On motion of Mr. McConnell,

The communications and propositions in relation to holding the Fair for 1862, were referred to a committee of three, with instructions to report during the present meeting.

The President appointed, as said committee, Messrs. Wait, Ozburn and McConnell.

The subject of awarding premiums on essays was then taken up, and the following committees were appointed to examine and report on the same.

On Breeding and Raising Horses—Messrs. Ozburn, Brown and H. I. Chase.

On Practical Farming in the north half of Illinois—Same parties.

On Road Making—Same parties.

On Preparation of Soils—Messrs. Ellsworth, Reynolds and Corbett.

On Bread Making—Same parties.

On Drainage—Same parties.

On Orcharding in Illinois—Messrs. Ellsworth, C. T. Chase and H. I. Chase.

On Cotton Culture in Illinois—Messrs. Wait, Wilber and Van Epps.

On the Culture of Chinese and African Sugar-cane, the Expression of the Juice and the Manufacturing of Sirups and Sugar—Messrs. Ellsworth, Mattson and Singleton.

On Insects Injurious to Vegetation—Messrs. Holder, Worthen and J. B. Turner.

On motion of Mr. Ellsworth,

Resolved, That the same per cent. be paid on premiums awarded at the present meeting as was paid on the premiums awarded at the late Fair of this Society in Chicago.

The report of the Committee for the year 1861, on Farms, Nurseries, Orchards, Groves and Drainage, was read, and, on motion of Mr. Ozburn, the awards were made accordingly, and the report placed on file for publication in the next volume of "Transactions."

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On motion of Mr. Ellsworth, the reports of all committees at the last Fair were ordered to be filed for publication in the next volume of "Transactions."

The Treasurer, John W. Bunn, presented a statement of the condition of the finances of the Society, in accordance with the requirements of a resolution passed yesterday.

A communication from Mr. George W. Gage, of Chicago, referring to financial matters connected with the last Fair, was read, and, on motion of Mr. McConnell,

Resolved, That the building Committee for the last Fair, consisting of Messrs. Van Epps and Ellsworth, be instructed to cancel and return to Mr. George W. Gage the contract between him and the Executive Committee, and release him from further obligation on condition that said Gage execute and deliver to the Executive Committee a release in full of all demands.

For the purpose of enabling the committees to examine essays, on motion, the Executive Committee adjourned until 9 A. M., tomorrow.

January 9, 1862.

The Executive Committee met, pursuant to adjournment,

President Van Epps in the chair.

Members present as before, and H. C. Johns, of the Board of Counselors.

The President read a communication from Mr. G. W. Gage, referring to his last communication, and also to the location of the next Fair.

On motion, referred to the committee heretofore appointed on the subject of location.

Mr. Ozburn, from Committee on Essays, made a partial report, and asked for further time, which was granted.

Mr. Brown, from the committee to which was referred the subject of holding Farmers' Conventions, reported favorably, and asked until the next meeting of the Executive Committee, to give the matter further consideration, perfect a plan and report further, which request was granted.

Mr. Holder offered the following:

WHEREAS, The labors of the authors of the essays presented for competition, are fully appropriated by the Society, and there is, therefore, a distinction in principle between the awards on these and on other articles and objects for which premiums are awarded, therefore,

Resolved, That the premiums on Essays be paid in full, and that the resolution on the subject passed yesterday be rescinded to that effect.

The subject of testing and deciding upon the merits of the various samples of sirup and sugar manufactured from Chinese and African sugar cane, being taken up, those visitors who were in attendance, were invited to assist in the examination, and the competitors present were requested to explain the details of their modes of manufacture, in addition to their respective written statements.

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After several hours spent in the thorough examination of the samples and the statements of the exhibitors, the awards were made, and will be found in their proper place in this volume.

On motion, adjourned until 2, P. M.

Two o'clock, P. M.

The Committee met, pursuant to adjournment.

Present, as before.

The Secretary presented the samples of sirups, and read the communication of Ed. B. Warner, Esq., of Morrison, Whiteside county, Illinois, and, on motion of Mr. Ozburn, it was, thereupon,

Resolved, That we have listened to the communication of E. B. Warner, Esq., of Whiteside county, Illinois, on the subject of the manufacture of sirup and sugar from the African and Chinese sugar canes, and examined the fine samples of such products presented by him in illustration of his article, and we hereby tender him our thanks for the interest he has taken in the subject, and for the valuable statistics he has collected and transmitted to us.

The samples of refined Sorghum sirup, presented by Mr. Belcher, of Chicago, were examined, visitors also participating, by invitation; after which, on motion of Mr. Holder, it was

Resolved, That the thanks of the Executive Committee be tendered to Mr. W. H. Belcher, of Chicago, for the many samples of excellent refined sirup, from the Chinese and African canes, which he has presented at this meeting for examination, through the kindness of W. W. Corbett, Esq., and that we receive with pleasure the assurance afforded by these samples, that a cheap sirup of very superior quality is henceforth, as a home production of Illinois, an established and most gratifying fact.

On motion of Mr. Holder,

Resolved, That some mode for the early publication of Essays and the Proceedings of this Society be devised, and that a committee be appointed by the President to report upon some plan at this meeting.

The President appointed Messrs. Holder, Ellsworth, McConnell, Wait and Ozburn.

On motion, the President and Secretary were appointed a committee to procure cotton seed for distribution.

The remainder of the day and evening was spent in examining Essays, etc., etc.

On motion, adjourned until 10, A. M., to-morrow.

January 10, 1862.

The Executive Committee met, pursuant to adjournment.

Present, as before, and also A. J. Mattson.

Mr. Wait, from committee on the location of the Fair for 1862, reported in favor of holding a meeting of the Executive Committee

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on Tuesday the 25th of February next, at these rooms, and that proposals for holding the Fair be advertised for and be received and decided upon at that meeting.

Mr. Ellsworth, from Committee on Essays, reported in favor of awarding the premium offered on Drainage to Mr. H. M. Kidder, of Evanston, Cook county, Illinois, protesting, however, against the author's views on mole ditching.

The report was received and adopted, and the award made accordingly.

The same committee also reported in favor of awarding to Mr. E. F. Newberry, of Litchfield, Scott county, the premium offered for Essay on the Culture and Manufacture of Sirup and Sugar from the Chinese and African sugar canes. The report was received and adopted, and the award made.

Also, in favor of awarding the premium to Mr. J. T. Little, of Dixon, Illinois, for his Essay on Orchards in Illinois.

Report received and adopted, and the award made.

Mr. Holder, from Committee on Insects Injurious to Vegetation in Illinois, said that the committee was absent, and asked additional assistance.

On motion, Messrs. Ellsworth and Mattson were added to the committee.

Mr. Holder, from the committee appointed to consider the propriety of making arrangements for the publication of the papers and other matters of interest before the Society, reported as follows:

Your committee, to whom was referred the matter of publication, would report that they have had the subject under consideration, and would recommend that the Society publish a Monthly Journal, to be called the "Journal of the Illinois State Agricultural Society," to be edited by the Corresponding Secretary, and under the supervision of a committee of three, to be selected from and elected by the Executive Committee, who shall make all contracts for and employ such assistance as may be required, for the properly conducting of such journal.

Your committee would further recommend that a Committee of Publication be now chosen, to whom shall be given power to mature this plan and procure the publication of the prospectus, and the first number of said Journal, at as early a day as practicable; and said committee shall make a full report of their action at each annual meeting of the Executive Committee, or as often as may be required.

Your committee would also state that they have given this matter much thought, and they believe that in an economical point of view alone, this would be a saving of much money to the Society, besides giving it a medium for the early transmission of much valuable information, that would otherwise be valueless to our people; that as a medium of announcing the action of this Board upon the various subjects brought before it, such a Journal would prove of great value to the Society and the State.

The report was received and adopted.

On motion of Mr. Ellsworth, a committee of three was chosen, to be called the Committee of Publication, and invested with power to make all necessary arrangements, contracts, etc., for the publication of a Monthly Journal of this Society.

Messrs. Ellsworth, McConnell and Holder were, thereupon, chosen as said committee.

On motion of Mr. Ellsworth,

Resolved, That the President and Executive Committee of this Society, impressed with the great value of the labors of the Geological Survey, and of the importance of placing

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the result of those labors within the reach of the farmers and others interested in the Agriculture and Mechanic Arts of the State, do hereby respectfully and earnestly request Governor Yates to authorize and direct the publication of the report of the present State Geologist, the copy of which, in manuscript, is, we learn, now ready for publication.

Mr. Worthen, the State Geologist, having invited the Board to visit the State Geological Rooms, on motion, the invitation was accepted, and the Secretary was directed to confer with Mr. Worthen as to the time for making such visit.

On motion, the invitation of Dr. Belkelheim, to hear him lecture on Japan and the Japanese, at the Hall of the House of Representatives this evening, was accepted.

A communication from Mr. Samuel Hooker, of Rushville, Illinois, on the subject of the culture and manufacture of Sorghum, having been read and the sample of sirup accompanying the same having been examined, it was, on motion,

***Resolved*, That a special premium of $10 be awarded for the same to Mr. Hooker.**

The subject of examining statements of exhibitors and awarding premiums on field crops, being taken up, the awards were made, and will be found in their proper place in this volume.

On motion, adjourned to 2, P. M.

Two o'clock, P. M.

The Committee met, pursuant to adjournment.

Present, as before.

Mr. Holder, from the Committee on Essays on Insects Injurious to Vegetation, reported that the Committee deem the Essays by Mr. Walsh and Mr. Thomas, both very valuable, and that they cannot come to a satisfactory decision as to their respective merits, and, therefore, recommend that a premium of twenty-five dollars be awarded to each.

Mr. Wait, from the Committee on Essays, on the Culture of Cotton in Illinois, reported in favor of awarding the premium of ten dollars to Mr. C. I. Chase; which report was received, and its recommendation adopted.

The Executive Committee proceeded to consider the recommendation of Awarding Committees, in regard to articles entered as miscellaneous at the last Fair of the Society. After an examination of the same, and a discussion of the subject, it was, on motion,

***Resolved*, That the Corresponding Secretary is hereby instructed to have executed and forwarded to the parties entitled to them, Certificates of Commendation, in accordance with the recommendations of the Awarding Committees, as made upon said Committee's books.**

On motion, adjourned until 9, A. M., to-morrow.

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January 11, 1862.

The Executive Committee met, pursuant to adjournment.

The forenoon was occupied in discussing matters pertaining to the offer of premiums for 1862, on Field Crops, and particularly in regard to the culture of Cotton, Coffee, Flax and Sorghum in Illinois.

On motion, adjourned to meet at 2, P. M.

Two o'clock, P. M.

The Committee met, pursuant to adjournment.

Present, as before, except Mr. Wait.

On motion,

The Corresponding Secretary was instructed to correspond with those parties to whom medals were awarded at the last Fair, with a view to substituting for the same either diplomas or cash.

The subject of Cotton Culture in Illinois being taken up, on motion, Mr. Ozburn was instructed to endeavor to procure a quantity of cotton seed, grown in this State the past season, for distribution the coming season.

The list of premiums to be awarded at the January meeting, in 1863, was then considered for awhile, when, on motion, the Committee adjourned to meet on Monday, the 13th inst., at 9, A. M.

January 13, 1862.

The Executive Committee met, pursuant to adjournment.

Present, as before.

The Committee resumed the consideration of the list of premiums, to be awarded to the winter meeting of 1863.

On motion, Lot 47 of the Premium List of the Society for the Fair at Chicago, adding thereto a premium of $3, for the best three bottles of Raspberry Wine, was embraced in the List of Premiums to be awarded at the winter meeting, in January, 1863.

On motion, the Premium List for the winter meeting of the Executive Committee, in January, 1863, as revised, was adopted, and ordered to be printed in the first number of the Society's Journal.

Adjourned to meet at 2, P. M.

Two o'clock, P. M.

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absence, receive the same per diem allowance, for such services, as the Recording Secretary would have been entitled to had he performed said duties.

Mr. M. L. Dunlap presented an Essay on the Culture of Cotton in Illinois, which, having been read by him to the Committee, it was, on motion, resolved that a special premium of $10 be awarded to him for the same.

On motion,

Resolved, That a premium of $10 for one bushel of the best Cotton seed for culture in Illinois, grown in this State in 1862, be added to the List of Premiums to be awarded by the Executive Committee in January, 1863. The seed to become the property of the Society for distribution.

The Committee of Publication being necessarily absent from the meeting of the Executive Committee,

On motion, adjourned until 10, A. M., to-morrow.

January 14, 1862.

The Executive Committee met, pursuant to adjournment.

On motion of Mr. Ellsworth,

Resolved, That a second premium be awarded to Washington Iles, of Sangamon county, for his Jack, General Walker, 4 years old, exhibited at the last State Fair, because of a mistake of his groom, in changing the entry, without authority from Mr. Iles.

On motion,

Resolved, That each member of the Executive Committee be supplied with five periodicals, as he may select, in addition to those heretofore ordered.

On motion, the Executive Committee adjourned, to meet at these rooms, on the 25th day of February, 1862.

ROOMS OF THE ILLINOIS STATE AGRICULTURAL SOCIETY,
Springfield, February 25, 1862.

The Executive Committee met, pursuant to adjournment.

President Van Epps in the chair.

Members present: Messrs. Ellsworth, McConnell, Whiting and Wait.

No quorum being present, on motion, the Committee adjourned to meet again, at 2, P. M.

Two o'clock, P. M.

The Executive Committee met.

The President in the chair.

Members present, as follows: Messrs. Ellsworth, Whiting, Holder, Singleton, McConnell and W. S. Wait, of the Committee; also, J. N. Brown, of the Board of Counselors.

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Letters were received from A. J. Mattson and H. S. Ozburn, stating, as reasons for their absence, sickness in their families, and expressing much regret at not being permitted to attend the meeting.

A letter also from Dr. Kile was read, stating that he was detained by reason of being in the service of his country, in the Military Department of the West.

Mr. Ellsworth, at his desire, was granted leave to place his reasons for differing with Mr. Kidder on the subject of drainage more at length upon the record.

On motion of Mr. McConnell, the following was adopted:

WHEREAS, C. B. Denio, the member of the Executive Committee from the first district, has removed beyond the limits of the State, and is now a resident of California; and,

WHEREAS, It is very important that the citizens of the first district have a representative among the Vice Presidents of this Society; therefore,

***Resolved*, That Charles H. Rosenstiel, of Stephenson county, be, and he is hereby requested to act as the Vice President and member of this Committee, during the remainder of said C. B. Denio's term of office.**

Mr. Rosenstiel being present accepted the invitation, and thenceforward took part in the deliberations of the Committee.

Mr. James N. Brown, as Chairman of the Committee to whom, at the last meeting, the subject of calling a Farmers' Convention was referred, made the following report:

The Committee to whom, at the last meeting of the Executive Committee, was referred the subject of calling a Convention of the Farmers of this State, respectfully report: That they have given the matter much reflection, and that they believe such a Convention will be productive of much good to the Agricultural interests of the State, and that, in view of all the circumstances, they further believe the most suitable time to hold such a convention is during the coming State Fair; and they, therefore, recommend to the Executive Committee, that proper and ample accommodations be made, at the place of holding the Fair, for the purpose, and that arrangements be entered into with a view to insure the attendance of lecturers.

JAMES N. BROWN, *Chairman.*

The report having been received and adopted, on motion, a committee, consisting of Messrs. Wait, Rosenstiel and Reynolds, was appointed, to make further arrangements, and report at the present meeting.

The committee, subsequently, through their chairman, Mr. Wait, reported, recommending that such a convention be held at Peoria, during the Fair of the present year; that general notice of the same be given, and invitations extended to such prominent practical and scientific men as may be thought best calculated to aid in carrying out the general objects of the Convention; and, also, that the public spirited citizens of Peoria be urged, at an early day, to give their best assistance, not only in securing a full and general attendance of all friends to agricultural improvement, but in providing ample accommodations for their convenience, when assembled. The report having been read and received, its recommendations were discussed by the Executive Committee.

Many and various views were expressed. All seemed to realize the importance of holding such a convention, under favorable auspices. The cause in which we are engaged could not fail to re-

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ceive great benefit as the result of its counsels. It was agreed that the State Fair week would probably be the best time, because of the railroad facilities likely to be then secured for those desiring to attend, and because of the reasonable certainty that more intelligent, earnest farmers would then and there be assembled than could be convened at any other time and place during the year. Some thought it might possibly be regarded as an assumption of authority for the Executive Committee to proceed to make out and publish a programme, select subjects for discussion, appoint lecturers, etc., as had been desired by Mr. Flagg and others whose communications were read; and it was finally, on motion of Mr. Ellsworth,

Resolved, That in response to many communications and suggestions from County Agricultural Societies and private individuals, in relation to holding a Farmers' Convention, during the present year, we recommend the holding of such Convention, at the city of Peoria, during the progress of the next Annual Exhibition of this Society.

That in case it is decided to hold such a convention at the time and place mentioned, the Executive Committee will make the necessary arrangements to accommodate such convention, during its session, and will heartily co-operate, as individuals, in furthering the objects of the same.

An interesting statement, by George H. Page, of Dixon, in relation to the manufacture of Sirup and Sugar from Chinese and African canes, was read, and ordered to be printed in the Journal. The sample of sirup presented by Mr. Page, and said to have been manufactured from the juice of cane which had been cut *eight weeks previous to its manufacture*, was tested by the Committee, and pronounced about equal to the best refined.

On motion, a vote of thanks was tendered to Mr. Page.

On motion, the awards made at the last meeting on Sirup made from Chinese sugar cane, were so altered as to give C. D. Roberts, of Jacksonville, a first premium, of $15, instead of a special premium of $10.

A communication from W. H. Osborn, Esq., President of the Illinois Central Railroad, to President Van Epps, on the subject of procuring cotton seed, and distributing the same in this State, was read, and,

On motion of Mr. Ellsworth,

Resolved, That, with much gratification, we acknowledge the interest taken by W. H. Osborn, Esq., President of the Illinois Central Railroad Company, in the promotion of the Agricultural interests of the West, and, especially, his efforts to establish this particular branch of agriculture in Illinois.

Resolved, That the capability of Illinois to produce cotton for market in competition with those regions where it has heretofore successfully grown, deserves at the hands of our farmers a thorough trial, and that we will use every proper effort to insure the necessary supply of good seed, and encourage the experiment of its production.

On motion, the Executive Committee adjourned until 9, A. M., tomorrow.

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February 26, 1862—9, *A. M.*

The Executive Committee met, pursuant to adjournment.

Present, as before.

A very interesting report from the Awarding Committee on Natural History, at the last Fair, was read and ordered to be published in the Journal, and a vote of thanks was, on motion of Mr. Whiting, tendered to J. P. Weston, for the same.

Also, the report of Wm. Duane Wilson, Esq., as chairman of one of the committees in class "F," was read and referred to the Secretary, for publication.

A communication was read from Miss M. E. Murtfelt, of Oregon, Ogle county, Illinois, suggesting the propriety of adding to the list of subjects for Essays, one or more suited to the pen of woman.

Whereupon, on motion of Mr. Holder,

Resolved, That a premium of $10 be offered for the best approved Essay, written by a lady, on "The Indoor Adornment of Home."

Committees were then appointed to revise the Premium List for the next State Fair.

On motion, the Executive Committee took a recess until 2, P. M., having made the location of the State Fair for 1862, the special order for that hour.

At 2, P. M., the Committee was called to order.

The subject of locating the State Fair for 1862, being taken up, Horace Capron, Esq., and Peter Sweat, Esq., as delegates representing the County Agricultural Society of Peoria county, and Mr. Capron being President of the same, presented a proposition and explained, verbally, the details designed to be embraced in such proposition.

M. C. Goltra, President of the Morgan County Agricultural Society, also presented a written proposition, on behalf of the Society and City of Jacksonville, to comply with the published specifications and requirements, in case it was thought best to hold the Fair on their grounds.

A communication was read from A. Duffield, of Sandoval, stating that, in consideration of the present condition of the country, it had been determined to withdraw the application heretofore made for that point.

After hearing the various propositions and representations of parties on the subject, the Board resolved itself into a Committee of the Whole, to resume the consideration of the Premium List; and, after spending some hours in this work, until half-past seven o'clock, P. M.

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Half-past seven o'clock, P. M.

The Committee met. Present, as before. Col. Wait in the chair.

Premium List taken up, and the revision proceeded with until 9, P. M., when the committee rose, reported progress, and asked leave to sit again.

On motion, the Executive Committee adjourned until 9, A. M., tomorrow.

February 27, 1862—9, *A. M.*

The Executive Committee met, pursuant to adjournment.

President Van Epps in the chair.

Present, as before.

On motion of Mr. Whiting, the subject of locating the next Fair was taken up; pending which, Mr. Holder offered the following:

Resolved, That distilled and malt liquors be excluded from sale on the Fair Grounds, at the next Fair.

Which resolution, after much debate by the members present, was adopted by the following vote:

YEAS—Messrs. Rosenstiel, Holder, Ellsworth and President Van Epps.

NAYS—Messrs. Whiting, McConnell and Wait.

On motion, the Committee then proceeded to ballot for the place for holding the Fair for 1862; which being done, resulted in the unanimous choice of Peoria.

On motion of Mr. Ellsworth,

Resolved, That the next Fair of the Society be held at Peoria, provided the citizens of that place, or responsible parties, agree to comply with the requisitions of the Society, as they are represented to be willing to do by their delegates, Col. Capron and Col. Sweat.

On motion, the Executive Committee resolved itself into Committee of the Whole, to consider the Premium List, Col. Wait in the chair.

At 12, M., the Committee took a recess until 1, P. M., at which time they met and resumed the consideration of the Premium List. Again, they took a recess until half-past seven o'clock, when, on being called to order, the revision of the Premium List was continued. After a time, the Committee rose, reported progress, and asked leave to sit again.

President Van Epps having resumed the chair,

On motion of Mr. Ellsworth,

Resolved, That the Premium List reported by the Committee of the Whole, and extending through Class "E," be adopted.

Resolved, That the next Fair of this Society commence on Monday, September 29, and continue six days.

On motion of Mr. McConnell, it was

Ordered, That a memorial of the Executive Committee be signed by the President and Corresponding Secretary, and forwarded to the President of the United States, represent-

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ing that the seeds of the Chinese and African sugar canes in this country are becoming rapidly and alarmingly deteriorated, by hybridization, and, perhaps, other causes; that the sugar and sirup producing interest has already, in the West, assumed a position of so great importance that the importation of a new supply of pure seed is worthy of the early attention of the Federal Government; that to this end, and also to obtain all possible information relating to the processes of manufacture pursued in the sugar-growing districts of China and Africa, an agent should be appointed by the Federal Government to visit those countries, and secure for the United States the best varieties of seed, together with reliable intelligence in regard to the manufacture, respectfully designating W. W. Corbett, Esq., of Chicago, as a gentleman identified with the Agricultural interests of the West, fully trustworthy, intelligent and competent to discharge the duties of such agency, and recommending his appointment.

On motion, the Executive Committee adjourned to meet at 9, A. M., to-morrow morning.

February 28, 1862—9, *A. M.*

The Executive Committee met, pursuant to adjournment.

President Van Epps in the chair, and members present as before.

On motion, the Committee resolved itself into Committee of the Whole, to continue the revision of the Premium List, Col. Wait in the chair.

The morning session having been consumed at this work, the Committee took a recess until 2 o'clock, P. M., when the same work was resumed, and continued until completed, when the Committee arose, reported accordingly, and asked to be discharged.

President Van Epps having resumed the chair, on motion, Mr. McConnell,

Resolved, That the Premium List for 1862, as made up and reported by Committee of the Whole, be adopted.

Resolved, That each Awarding Committee consist of five persons, three to form a quorum.

On motion, the Executive Committee proceeded to consider the subject of testing agricultural implements and machinery before awarding premiums thereon.

James N. Brown offered the following preamble and resolution:

WHEREAS, There is some difference of opinion in the minds of the members of the Executive Committee as to the mode and manner of awarding premiums on farm implements and machinery; and, whereas, it is the intention of said Committee to continue to offer premiums for the best, most useful and improved implements and machinery for the farmer of Illinois; therefore,

Resolved, That hereafter this Society will offer and award no premium on any implement or machine without satisfactory test.

Adopted unanimously.

On motion of Mr. Ellsworth,

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For the best Combined Reaper and Mower	Diploma and	$75
For the best Reaper	" "	50
For the best Mower	" "	50
For the best one horse Mower	" "	20
For the best Heading Machine	" "	50
For the best Grain Binder, which can be readily attached to any ordinary Reaper	Medal.	

Headers to compete with Headers, and not with other machines.

That an entry fee of fifty per cent. upon the cash premiums offered, be required to be paid by each exhibitor.

That no award shall be made in any case unless two or more machines compete for the same.

That entries may be made with the Corresponding Secretary until the 15th day of June next.

That the machines be required to be on trial at the State Fair, at Peoria, at which time and place the awards shall be publicly announced.

That the details of the requirements and scale of points be such as have been sanctioned by experience in similar trials in the United States, and that the Executive Committee of this Society be the Awarding Committee.

The report was received and adopted.

On motion, the President was directed to appoint the time for commencing said trial, whenever, in his judgment, the maturity of the crop in Lee county would warrant him to do so.

The appointment of regular committees for the State Fair was, by consent, taken up.

On motion,

Resolved, That the Executive Committee now proceed to appoint Superintendents for the various Departments.

In accordance with which resolution, the following appointments were made:

Superintendent Class	A	Mr. Whiting.
" "	B	Mr. Singleton.
" "	C, D and E	Mr. McConnell.
" "	F	Messrs. Kile and Rosenstiel.
" "	G	Mr. Oeburn.
" "	H	Messrs. Wait and Galusha.
" "	I and L	Mr. Holder.
" "	K	Mr. Mattson.
" "	M	Mr. W. J. Phelps.
Superintendent of Grounds		Mr. H. Capron.

On motion of Mr. McConnell, it was resolved to create a Grain and Feed Department, and to leave to President Van Epps the appointment of the Superintendent thereof.

On motion, the Committee resolved itself into a Committee of the Whole, Col. Wait in the chair, and took up the appointment of Awarding Committees. After a time, the Committee took a recess until half-past seven o'clock, P. M., when the appointment of Award-

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DIXON, *July* 21, 1862.

On Monday, July 21, 1863, the following members of the Executive Committee were present at Dixon, Lee county: President Van Epps, Vice Presidents Rosenstiel, Mattson, Whiting, McConnell, Wait, and Ozburn, and Ex-President Webster, as also, the General Superintendent, Col. Horace Capron and the Corresponding Secretary, John P. Reynolds. Vice President Holder arrived subsequently.

The Committee assembled at the "Nachusa House," and entered at once upon a comparison of thoughts as to the best mode of procedure. Communications in writing, having reference to the coming trial, were received from several of the expected competitors, and duly considered. The subject of a scale of points as the basis upon which to make up the awards had been well considered by every member prior to his arrival, and after a free interchange of opinion, it was determined that each member should make his own notes in his own way, having reference to the relative merits and demerits of machines in the following particulars:

1. Quality of work—representing perfection	40
2. Simplicity of construction	10
3. Durability	15
4. Ease of draft	20
5. Market price	5
6. Facility of management	10
	100

In addition to these principal points, each of which must be considered in examining every Reaping, Mowing and Heading machine, the following sub-points, which readily range themselves under one or the other of the foregoing, were carefully considered:

1. Weight of machine.
2. Adjustability of cutting apparatus to different hights of stubble.
3. Portability.
4. Rapidity of action, or length of time required to cut a given area.
5. Ease of putting in and out of gear.
6. Accessibility of parts for purposes of repairs, oiling, etc.
7. Convenience and safety of operator.
8. Facility of backing and turning.
9. Facility with which the size of gavels may be controlled by the driver.
10. Side draft.
11. Weight on horses' necks.

Still others, found in the various scales which have been used, and reports made, and others referred to in the communications of the competitors, were brought to the attention of the members.

Each was furnished with a note book of ample dimensions, containing a complete list of entries and scale of points, in which to record his impressions.

The Executive Committee met regularly every morning, during the progress of the trial, to discuss the work of the day and prepare programme for the following.

The trial commenced in the field on the morning of the 22d, according to announcement, and continued without interruption until the evening of Saturday, the 26th of July.

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At the conclusion, on the evening of Saturday, resolutions were passed by the Executive Committee, referring in the warmest terms to the kindness and courtesy of the exhibitors, and tendering their thanks to the citizens of Lee county, and especially to Col. John Dement, Mr. Charles Dement, Col. Eyre, Mr. Moore and Mr. Moeller, who are the owners of the fields and crops in which the trial was held; to Messrs. Crawford and Ayres, the surveyors; to Col. Capron, the Superintendent, and Mr. Cropsey, his assistant. (See report in proper place.)

The Committee then adjourned to meet at Peoria, on the 19th of August next.

"PEORIA HOUSE," PEORIA, ILLINOIS,
August 19, 1862.

Pursuant to call of the President, the Executive Committee of the Illinois State Agricultural Society met.

President Van Epps in the chair, and the following members present: Lewis Ellsworth, C. H. Rosenstiel, A. J. Mattson, R. H. Whiting, A. B. McConnell, and Wm. S. Wait; also, James N. Brown, of the Board of Counselors, and John P. Reynolds, Corresponding Secretary.

The President stated the object of the meeting to be, as agreed upon at Dixon, to consider the matter of awards on the trial of Reapers, Mowers, etc., and to examine the state of preparation of the Fair Grounds, at this place, for holding the coming Fair.

Some of the citizens of Peoria, and members of the County Agricultural Society, having called for consultation in relation to holding the State Fair, General Sweat stated that he desired the Executive Committee to visit the Fair Grounds before any expression of opinion was had.

Col. Capron stated that the Military, without any knowledge or consent of the Board of the County Society, had taken possession of the Fair Grounds; that the citizens generally were averse to holding the Fair, and that it was madness to attempt it.

Mr. H. I. Chase stated that very many of the best citizens really thought it was wrong to attempt to hold the Fair at this season.

Gen. Sweat added, that up to the trial at Dixon he thought the people were in favor of a Fair, but since the call for 600,000 men, things have changed. Everybody is now opposed to it, and it certainly would be a failure.

It was desired that the Committee visit the Fair Grounds, and see the condition of affairs there.

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Mr. Woods had not conversed with any one for some time who thought it would do at all to hold a Fair, and some thought it would be criminal to attempt to do so.

The Executive Committee agreed to visit the Grounds immediately after dinner.

On motion, adjourned to meet again at 2, P. M.

Two o'clock, P. M.

The Committee met, pursuant to adjournment, after having visited the Fair Grounds, in company with citizens of Peoria.

Present, as before.

After a full discussion, the following preamble and resolution were adopted:

WHEREAS, After conference with the local committee of the citizens of Peoria, and the Peoria Agricultural Society, and after careful consideration of the circumstances by which we are surrounded; and, whereas, the Fair Grounds selected for the exhibition of this Society the present year, have been taken possession of by the military authorities, and will probably be occupied by such authorities until after the time appointed, thus rendering the holding of such Exhibition, at the time and place heretofore announced, physically impossible; therefore,

Resolved, That however much we may regret the necessity for it, we feel that we cannot do otherwise than yield to the force of circumstances, and that the exhibition of this Society, for 1862, be and it is hereby postponed until such time and place, during the fall of 1863, as the Executive Committee may hereafter determine.

The subject of awarding the premiums was then taken up, and the following awards made:

For the best Combined Reaper and Mower, to John P. Manny, of Rockford, Winnebago county, Illinois, ... Diploma and $75

For the best independent Reaper, to Walter A. Wood, of Hoosick Falls, N. Y., "Wood's Self Raker," ..... Diploma and $50

For the best independent Mower, to E. Ball, of Canton, Ohio, the "Ohio Mower," ..... Diploma and $50

For the best Heading machine, to Barber, Hawley & Co., of Pekin, Illinois, the "Haines' Harvester," ..... Diploma and $50

Walter A. Wood's one horse mower was highly commended as a machine of undoubted excellence in its class.

Adjourned until to-morrow morning.

August 20, 1862.

The Executive Committee met, pursuant to adjournment.

Present, as before, except Mr. Whiting.

A communication was read from Wm. H. Van Epps, Esq., on behalf of the citizens of Dixon, proposing to furnish the necessary

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fixtures and accommodations for holding the Society's next annual Fair, for the year 1863.

On motion, the proposition was ordered to be placed on file.

On motion of Mr. Ellsworth,

Resolved, That the Executive Committee of this Society hold its regular annual meeting in January next, at the Rooms of the Society, in Springfield, and make the awards on premiums offered for that meeting, substituting in payment of the same diplomas and certificates for medals and coin.

On motion of Mr. Wait,

Resolved, That although circumstances of a local character, and beyond the power of this Committee to control, have made it necessary to forego the holding of the Fair for 1862; yet, in the opinion of this Committee, there is nothing in the present situation of public affairs to justify the measure; and that at no time since the organization of the Society has such an exhibition been more necessary for the encouragement of the great and essential interests of Agriculture and the Mechanic Arts.

On motion, the following was adopted:

WHEREAS, In the crisis through which the Government of the United States, and the free institutions secured to the people by such Government, are now passing, *every loyal citizen is expected to do his whole duty*; and,

WHEREAS, The recent calls by the President for soldiers, have been addressed to those only who are under forty five years of age, thus excluding from the military service of the country thousands and tens of thousands of patriotic loyal citizens who are both willing and anxious to devote their best energies to the suppression of this unholy rebellion, and to the maintenance of the supremacy of the Constitution and Laws; and,

WHEREAS, As members of the Executive Committee, and officers of the State Agricultural Society, in co-operation with the officers and members of the County Agricultural Societies in this State, we believe it to be in our power to render efficient aid in the organization, in this State, of one or more brigades, to be composed mainly of exempts, able-bodied men over the age of forty-five, for special service under the military authority of the Federal Government in the States of Missouri, Kentucky and Illinois; therefore,

Resolved, That in order to accomplish the end proposed, we hereby tender our individual energies to the President of the United States, and most earnestly urge upon him the propriety and necessity of acceding to the request of the Governor of this State, for organizing and placing in the field, at the earliest practicable day, the forces which may thus be raised; thus adding essentially to the army at his disposal, insuring the defense and safety of our borders, and relieving, in that far, the other branches of the service.

Resolved, That James N. Brown and William H. Van Epps be authorized to confer with the President of the United States, in relation to the subject matter of the foregoing preamble and resolution, and report, by correspondence, with the members of the Board.

[The consent of the War Department to the proposed organization was not obtained.]

On motion, adjourned, *sine die*.

ROOMS OF THE STATE AGRICULTURAL SOCIETY,
January 6, 1863—2, *P. M.*

The Executive Committee met, pursuant to the call of the President.

Present: Messrs. Mattson, Rosenstiel, McConnell, Holder, Brown and Webster.

On motion, James N. Brown was called to the chair, and Mr. G. W. Kinney, of Edwards county, proceeded to address the meeting on the subject of curing Hog Cholera; after which, the meeting adjourned until half-past seven o'clock, P. M.

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Half-past seven o'clock, P. M.

No other members having arrived, those present spent the evening in examining the samples of sugar and sirup, on exhibition; after which the Committee adjourned until to-morrow, at 9, A. M.

January 7, 1863—9, *A. M.*

The Executive Committee met, pursuant to adjournment.

Present: Ex-Presidents Brown, Webster and Ellsworth; Vice Presidents Mattson, Rosenstiel, Whiting, Holder, McConnell, Kile and Ozburn.

Letters from President Van Epps, stating the cause of his absence, he having been called, by the illness of a son in the army, to Newbern, North Carolina, were in possession of members.

On motion, Mr. Ellsworth was called to the chair.

The subject of awarding premiums on Field Crops, Sugar and Sirup, was taken up, and, after a careful examination of samples and a consideration of the statements of exhibitors, the following awards were made:

For the best 20 lbs. of Sorgho or Imphee Sugar, made upon Cook's Evaporator, to H. R. Smith, of Quincy, Illinois—the Cook's Evaporator, offered by Messrs. Blymyer, Bates and Day.

For the best 10 lbs. of sugar, a sample of 100 lbs., made by the exhibitor from Imphee cane, to Jonathan H. Smith, of Quincy, Illinois.....Diploma.

The sample presented by Samuel Hooker was highly commended.

For the best gallon of sirup—a sample of at least one barrel, made by the exhibitor, from Chinese cane; to C. D. Roberts, of Jacksonville, Illinois.....Diploma.

For the best gallon of sirup—a sample of at least one barrel made by the exhibitor, from Imphee cane, to David Hutchison, of Rushville, Schuyler county, Illinois. . Diploma.

On motion of A. B. McConnell,

Resolved, That the sample of Imphee sirup, presented by E. S. Phelps, jr., of Bureau county, is the best sample of that variety on exhibition; but he not having complied with the requirements, no premium can be awarded to him for the same.

For the best 10 lbs. of sugar made from either variety of sugar cane, or from sugar beets, to David Brown, of Schuyler county, Illinois, for sample made from the Otaheitan a variety of Imphee.

On motion,

Resolved, That the sample of Imphee sugar, and the statement regarding its manufacture, presented by D. S. Pardee, of Rockford, Illinois, are of much interest, and deserve the atention of sugar manufacturers, as giving promise of the discovery of a cheap and simple method of producing sugar, having good crystals, good color, and free from waxy or glucose matter, and that the thanks of the Society be tendered to Mr. Pardee, for his zeal and intelligent efforts to advance the interests of sugar and sirup manufacture in the Northwest.

Resolved, That the sample referred to, with an abstract of the statement, be forwarded, at the close of this meeting, to the Department of Agriculture, at Washington.

On motion,

Resolved, That the samples of Imphee sugar exhibited by Mr. C. D. Roberts, of Jacksonville, Illinois, are light in color, but not so well crystalized nor so free from glucose matter

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as some other samples on exhibition; that the same is true of the samples of Chinese cane sugar presented by Henry Cook, of Mansfield, Ohio; and, further, that it is the opinion of this Committee, that the twenty pounds of Imphee sugar, shown by Mr. J. H. Smith, and stated by him to have been made from cane which had been frozen and thawed previous to manufacture, although darkest in color, is really the best granulated sugar on exhibition at the present meeting.

For the best essay on the culture of Sugar Cane and the manufacture of sugar and sirup therefrom, to J. H. Smith, of Quincy, Illinois.....Diploma.

The Committee then took a recess until half-past seven o'clock, P. M., at which hour the Committee came to order, Mr. Ellsworth in the chair.

The essay of Miss M. E. Murtfelt having been read—subject, "The Indoor Adornment of Home."—it was awarded a premium.....Diploma.

Mr. G. W. Kinney, by invitation, read to the Committee a paper on the Hog Cholera, and its cure. A general discussion of the subject followed, after which, on motion, the Committee adjourned until 9, A. M., to-morrow.

January 8, 1863—*Nine o'clock, A. M.*

The Executive Committee met, Mr. Ellsworth in the chair.

The subject of awarding premiums on Field Crops was again taken up.

For the best 20 acre field of spring wheat, the first prize of Ball's Combined Reaper and Mower, offered by E. Ball, of Canton, Ohio, was awarded to Samuel W. Arnold, of Cortland, DeKalb county, Illinois.

Second premium for not less than five acres of the same, was awarded to the same .....Diploma.

For the best crop of white beans, not less than one-half acre, to S. W. Arnold, of Cortland, DeKalb county.....Diploma.

For the best Peach Orchard, to Dr. C. B. Pelton, of Makanda, Illinois.....Diploma.

On motion, James N. Brown and C. W. Webster were appointed a committee to present to the General Assembly, now in session, a copy of the following memorial:

To the General Assembly of the State of Illinois:

The Executive Committee of the Illinois State Agricultural Society, respectfully beg to memorialize your honorable body on the following subject:

We have observed, with much concern, an effort being made in the present Congress of the United States, now in session, to repeal the law passed by the last regular session thereof, *establishing a Department of Agriculture.*

Representing the industrial classes of this State, so far as agriculture, in its broadest sense is concerned, and reflecting what we know to be the well-matured opinion of the great mass of intelligent farmers in the United States, we venture to ask your honorable body to instruct our Senators, and request our Representatives in Congress, to refuse their assent to, and meet with determined opposition, any and every effort which may be made in Congress to affect the vitality, or to cripple the usefulness of the National Department of Agriculture.

On motion of James N. Brown,

Resolved, That we regard the establishment of a Department of Agriculture, by an act of Congress, passed at its last regular session, as the gratifying evidence of a proper recognition, by the nation, of that interest which underlies the material prosperity of the United States.

Resolved, That, so far from deserving to be *destroyed*, the industrial classes and true public economy require most imperatively that this Department be, at an early day, extended and enlarged; and we hereby earnestly request our Senators and Representatives

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in Congress, to use every legitimate means to further and promote the ends for which the Department was established.

Resolved, further, That the Department of Agriculture belongs to the *people*, as distinguished from the *politicians*, and that those interested will take care that it be maintained.

Resolved, That the Corresponding Secretary be instructed to forward, to each of our Senators and Representatives in Congress, a copy of the foregoing resolutions.

The Committee then took a recess until half-past two o'clock, P. M., when they re-assembled, Mr. Ellsworth in the chair, and members present, as before.

The Corresponding Secretary presented a letter from Wm. H. Osborn, Esq., President of the Illinois Central Railroad Company, to President Van Epps, requesting some action of this Board, in relation to the necessity for the construction of a National Canal from Lake Erie to the Hudson river.

After a protracted discussion of the subject, the Corresponding Secretary was directed to prepare a memorial to the United States Congress, embodying the opinion of the Committee; which was done, and, after adoption, a copy of the same was directed to be transmitted to some one of our Representatives. The following is a copy of the memorial:

To the Honorable the Senate and House of Representatives, in Congress assembled:

Your memorialists, the Executive Board of the Illinois State Agricultural Society, beg to call the attention of your honorable body to the following subjects, having close relation to the important interests of the farmers of the Northwest, and to ask for the same your careful consideration and action, so far as it may properly be had. It is not designed to make a lengthy argument, but merely and very briefly to state facts, leaving to your enlightened statesmanship and patriotism to apply the necessary remedy.

The people of this State, together with those of the States lying north and northwest of us, are, and for a long time have been, suffering from the impossibility of bringing to the markets of the world a very large proportion of their surplus agricultural productions. No avenue of transit now open to them, has one-half the capacity to afford the necessary transportation.

There are three things, either of which, if accomplished, would, in the opinion of your memorialists, afford some degree of relief, and which, conjointly, and as one national measure, would, in its execution, add immensely to the national wealth, and which is absolutely demanded to relieve the people of the Valley of the Mississippi river and its tributaries of some of the burdens they are now compelled to bear.

We state them in the order of their importance to the region of country alluded to:

1st. The opening up and continued free and safe navigation of the Mississippi river.

This highway, with its navigable tributaries, extending itself into every portion of the Northwest, is the only natural avenue upon which to freight our surplus products to the ocean; and every hour it remains closed to the safe conduct of our commerce, inflicts a serious injury upon the producing interests.

2d. The connecting, by ship canal, the Mississippi river with the waters of Lake Michigan.

The importance of this, both in an economical and military point of view, need not be more than adverted to.

3d. With the first two accomplished, the construction of a National Canal from Lake

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Resolved, That the propriety of exempting the capital invested and to be invested in this State in the manufacture of cotton, sugar and flax, from taxation for State and County purposes, for a term of years, is a subject well worthy the careful examination of the General Assembly of this State, and they are hereby most respectfully desired to give the same a favorable consideration.

Which, on motion, was adopted.

On motion, the Corresponding Secretary was authorized to subscribe for five Agricultural or other papers or periodicals, for each of the members of the Executive Committee, for the ensuing year.

The following accounts were audited, and ordered to be paid:

J. Bonham, advertising Reaper and Mower trial, in the "Farmers' Advocate"	$ 25 00
Weber & Smith, printing and stationery	112 00
Sherman & Bacon, stationery	98 48

On motion of Dr. Kile,

Resolved, That the members of the General Assembly, now in session, be invited to visit the Agricultural Rooms, and examine the samples of Illinois sugar, sirup and other productions, now on exhibition.

Resolved, That we hold the usual annual Fair, during the ensuing fall, the place to be determined at the next meeting of the Committee.

The Executive Committee resolved itself into a Committee of the Whole, to consider the specifications for fixtures and accommodations for the next Fair. After a time, the Committee arose, reported their labors completed, and asked to be discharged.

On motion, the specifications, as reported by the Committee of the Whole, were approved and adopted.

On motion, adjourned to meet to-morrow, at 9, A. M.

January 9, 1863—9, *A. M.*

The Executive Committee met, pursuant to adjournment.

Mr. Ellsworth in the chair, and members present, as before, except Dr. Kile and Mr. Whiting.

On motion of Mr. Mattson, a memorial to Congress, on the subject of the currency, representing the necessity of a circulating medium of uniformly equal volume and value, was unanimously approved, and the approval indorsed on the copy of the same.

Mr. John W. Bunn, Treasurer, presented his report of receipts and expenditures for 1862; and, on motion, a Committee, consisting of Messrs. Mattson, Ozburn and Rosenstiel, was appointed to examine the same, with the vouchers therefor.

On motion, Messrs. Webster, Ozburn, McConnell and Ellsworth, were appointed a Committee, to attend to having a bill introduced into the Legislature, to print the next volume of the "Transactions" of this Society.

By consent, the preparation of a List of Premiums, to be awarded at the next winter meeting of the Committee, was taken up, in Committee of the Whole, Mr. Ellsworth in the chair. Pending the consideration of which, the Committee took a recess until after

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dinner, when, on re-assembling, the labor was resumed. Afterward, the Committee arose, reported progress, and asked to sit again.

The Committee on Publication, by their Chairman, Mr. Ellsworth, reported as follows:

Your Committee on Publication beg leave to report: That, in accordance with the action of the Board, at their meeting in January, 1862, they contracted for the publication of the Society's Journal, for the term of one year, with Charles H. Lanphier, of this city. The number of copies printed for each of the first six months, was six thousand—the maximum cost for any one month being $147 75 for said number.

For the three months next following, five thousand copies, each month, were published, and for the remaining three months, one thousand copies each.

Whilst your Committee grant that, financially, it has not been a success, yet, by spreading before the people a large mass of useful matter, at an earlier day than by the ordinary mode of publication, thereby giving it a practical value; also, by keeping the Society in nearer connection with the people of the State, they believe it has subserved the purpose for which it was established, and has given to the people the full value of the money expended.

The contract for the publication of the Journal having expired, and the present being the year for the regular publication of a volume of the Society's "Transactions," the Committee suggest the propriety of issuing a quarterly sheet, for gratuitous distribution.

The above report having been accepted, it was, on motion,

Resolved, That the Society publish a Journal quarterly, for the ensuing year, and the Committee be discharged.

Whereupon, the following gentlemen were appointed to make the necessary arrangements and contracts for printing said Journal: Messrs. Ellsworth, McConnell and Mattson.

On motion, the Executive Committee resolved itself into a Committee of the Whole, and resumed the consideration of the List of Premiums, to be awarded at the next winter meeting.

Having completed their labors, the Committee rose, reported the List finished, and asked to be discharged.

The report was accepted and adopted, when, on motion, the Executive Committee adjourned until to-morrow, at 9, A. M.

January 10, 1863—9, *A. M.*

The Committee met, pursuant to adjournment.

Present, as before.

The Committee appointed to examine the Treasurer's account

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(See Report of Trial of Harvesting Implements, embodied in regular report of the Executive Committee.)

Mr. Ellsworth having resumed the chair, it was, on motion,

Resolved, That when the Committee adjourns it be to meet again, on the 17th day of February, 1863, to receive proposals for holding the next Annual Exhibition of the Society, and to prepare the Premium List therefor.

On motion, adjourned, to meet February 17th, 1863.

ROOMS OF THE ILLINOIS STATE AGRICULTURAL SOCIETY,
Springfield, February 17, 1863.

The Executive Committee met, pursuant to adjournment,

President Van Epps called the Committee to order.

Members present: Messrs. Ellsworth, Mattson, Wait, Whiting, Kile and McConnell.

On motion of Mr. Ellsworth, it having appeared that Mr. Rosenstiel was detained at home, on account of sickness, Capt. E. H. Beebe, of Galena, from the same Congressional district, was invited to be present during the sitting of the Committee.

The Corresponding Secretary stated that he had complied with the various instructions of the Committee, at the last meeting, in relation to the transmission of samples of the sugar on exhibition to the Commissioner of Agriculture at Washington, of the copies of the Society's memorials to members of Congress and others. He also presented and read a programme of the International Exhibition, to be held at Hamburg, Germany, commencing July the 14th, 1863, and letters from Austin Baldwin & Co., New York, in relation thereto. Also, a communication from Leopold Richter, of this city, proposing to sell the Society one of his maps of Illinois.

On motion,

Resolved, That the Corresponding Secretary be instructed to purchase of Mr. Richter, such map of the State of Illinois, at the price named, ($8,) and that the Treasurer pay for the same, out of the funds in his hands.

A communication was presented by the Secretary from the Corresponding Secretary of Iowa, advising the Committee that the Annual Fair of Iowa, for 1863, will be held at Dubuque, commencing September 15.

The Corresponding Secretary also presented, for consideration, a copy of the law of New York, for the collection of Agricultural Statistics and forms of blanks for use by enumerators under the same. Also, read a supplement to Dr. C. B. Pelton's statement in regard to his Peach Orchard. Also, letters from the Commissioner of Agriculture, acknowledging the receipt of samples of sugar, and speaking in high terms of their character and promise. Also, laid on the table, for distribution, packages of tobacco and other seeds, received from the Department of Agriculture, and one hundred

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copies of Klippart's Treatise on the Culture, Properties and Qualities of the Beet, from W. S. Osborn, President of the Illinois Railroad Company. Also, a communication from C. D. Roberts, of Jacksonville, suggesting a modification of the List of Premiums, for the winter meeting in 1864, on the subject of sugar from the various canes, so that sugar from each variety of cane might be brought into competition with its variety alone.

On motion, the Committee made the subject of locating the Fair, for 1863, the special order for 2, P. M.

Two o'clock, P. M.

The Committee met, pursuant to adjournment.

Present, as before, and Capt. J. N. Brown, of the Board of Counselors.

The subject of the time and place for holding the Fair for 1863, was taken up.

Mr. J. H. Pickrell made a statement, on behalf of Decatur, as a point to be considered.

On motion, the further consideration of the subject was postponed until 2, P. M., on Thursday.

On motion of Mr. Whiting,

Resolved, That the next Annual Exhibition of this Society be held, commencing on Monday, September 28th, and continue during the week.

On motion, the appointment of Superintendents for the Fair was then proceeded with, and the following were the appointments made:

Superintendent	Class A	R. H. WHITING.
"	" B	JAMES W. SINGLETON.
"	" C, D and E	A. B. MCCONNELL.
"	" F	WILLIAM KILE.
"	" G	H. S. OZBURN.
"	" H	WILLIAM S. WAIT and C. H. ROSENSTIEL.
"	" I and L	R. H. HOLDER.
"	" K	A. J. MATTSON.
"	" M	C. W. WEBSTER.

On motion, adjourned until 7, P. M.

Seven o'clock, P. M.

The Committee met.

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February 18, 1863—8, *A. M.*

The Executive Committee met, pursuant to adjournment.

Present, as before, excepting Mr. Whiting, who was compelled to leave, by orders from the War Department.

The President called Dr. Kile to the chair, and offered the following resolution:

Resolved, That this Society deem it eminently proper and expedient, as well as strictly in accordance with the settled policy of the Committee regarding all labor-saving implements and machinery, and especially in regard to earth displacing implements for farm culture, that they be thoroughly tested before any award shall be made, and they do hereby instruct Ex-President Webster, Superintendent of Plowing Match, to procure suitable fields, at or near the Fair Grounds, for the year 1863, and that he make all necessary arrangements for such test, and conduct the same during the week previous to holding such Fair, in order that suitable time, care and attention be thus devoted to *all* entries made, of the character referred to, and that the successfully competing implements have the insignia of award attached to the same on the morning of the third day of the Fair.

On motion, Mr. A. W. Martin, of Knoxville, Knox county, was invited to take a seat with the Committee, and accordingly did so.

On motion,

Resolved, That the Corresponding Secretary be and is hereby instructed to obtain, for publication in the Journal, either by personally visiting the localities where grown, or by correspondence, reliable information in relation to the culture and preparation for market of cotton and tobacco in Illinois, with such estimates of the past year's product as he may be able to make, and that the Treasurer is hereby ordered to pay the reasonable expenses of such commission.

On motion, the preparation of the Premium List for 1863, was taken up, and proceeded with to Class "E," inclusive, when, on motion, the Committee adjourned until 2, P. M., when, upon re-assembling, Dr. Kile was called to the chair, and the work on the Premium List resumed, and continued until 6, P. M., when, on motion, the Committee adjourned until 7½, P. M., at which time they again met, and resumed work on the Premium List, and also the appointment of committees, continuing to Class "F."

The programme for test of implements was made, as follows:

For the best two-horse plow for general purposes	Society's Gold Medal.
For the best two-horse plow for sod and turf	" Silver "
For the best one-horse corn plow	" " "
For the best gang plow	" " "
For the best single plow	" " "
For the best one-horse triple or double shovel plow	" " "
For the best trench plow	" " "
For the best subsoil plow	" " "
For the best newly invented implement by which the soil can be well broken up and thoroughly prepared for seeding at less cost than by ordinary plowing	" Gold "
For the best approved ditching machine for making open drain, combining efficiency, portability and cheapness, so as to warrant its adoption and general use by the farmers of Illinois	" Silver Medal.
To which the Illinois Central Railroad Company adds a special premium:	$250 00
For the best one-horse cultivator	Silver Medal.
For the best two-horse independent cultivator	Gold "
For the best two-horse cultivator, with combination for seeding and planting	" "
For the best two-horse harrow	Silver "
For the best field roller	" "
For the best grain drill	" "
For the best corn planter	" "
For the best broad cast grain sower	" "
For the best practical and approved machine to cut and shock corn	" "
To which the Illinois Central Railroad Company adds a special premium	$250 00

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The Corresponding Secretary presented samples of wine made by Dr. Noble, of McLean county, and read his statement of its manufacture. The Committee examined it, by tasting, and such as were experts pronounced the quality of the sample "good;" and Dr. Kile commended it for medicinal and other purposes.

On motion, adjourned to meet at 9, A. M., to-morrow.

February 19, 1863—9, *A. M.*

The Committee met, and Dr. Kile having been called to the chair, the consideration of the Premium List was resumed, and continued until 12, M., when, on motion, the last Premium List, as revised, was adopted.

On motion, adjourned until 2, P. M.

Two o'clock, P. M.

The Committee met, pursuant to adjournment.

President Van Epps in the chair.

In accordance with special order, the subject of the time and place of holding the Fair of 1863, was taken up.

The applications of George W. Gage, of Chicago, and of J. H. Pickrell and H. Prather, for Decatur, were read and discusssed.

Mr. McConnell offered a resolution to locate the Society's Fairs, for 1863 and 1864, at Decatur; the consideration of which, on motion of Mr. Mattson, was postponed two hours.

In the meantime, Dr. Kile offered the following, which was adopted:

Resolved, That the Executive Committee pay to John P. Reynolds thirteen hundred dollars, for his services for the current year, as Corresponding Secretary of the Illinois State Agricultural Society, commencing on the 1st day of January, 1863, and three dollars per day, in addition, while actually employed in dicharging the duties of Recording Secretary of this Society.

At the expiration of the two hours, Mr. McConnell called up his resolution, in relation to locating the Fair, and moved its adoption; when it was passed, as follows:

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stituted a Building Committee, with authority to fix the points for the location of the buildings and other structures, and designate their form and capacity.

On motion, adjourned until 7, P. M.

Seven o'clock, P. M.

The Committee met, pursuant to adjournment.

Present, as before.

On motion of Dr. Kile, the Corresponding Secretary was instructed to endeavor to procure the passage of an act, by the General Assembly, for the collection of Agricultural Statistics.

On motion, the following preamble and resolutions were adopted:

WHEREAS, A Trial of Harvesting Implements was held by the Society, at Dixon, in July, 1862, and was carried out in full accordance with the programme for the same, except that, by reason of failure to hold the State Fair, no opportunity to exhibit these implements at such Fair was offered to the contestants; and whereas, by standing rule of this Society, no premium can be awarded to any farm implement, without trial, and as it is not deemed best to hold another trial of those implements during the present season; therefore,

Resolved That those competitors are hereby respectfully invited to be present with the same, or similar machines and implements, at the Fair of the Society for 1863.

Resolved, further, That all other manufacturers of Reapers, Mowers, Headers and Grain Binders, are also requested to place samples of their manufactures on exhibition at the same time and place.

On motion, it was

Resolved, That the Field Trial of Implements, provided for by resolution yesterday, be held at or near the city of Decatur, commencing on the 21st day of September next.

The following gentlemen were appointed members of the Awarding Committee for such trial:

AMOS C. STEDMAN, (Chairman), Dixon, Illinois.
G. G. WEEKS, Knoxville, "
S. M. PARSONS, Springfield, "
SAMUEL GRAHAM, Paris, "
WILLIAM WATKINS, Greenville, "

(See report of trial in proper place.)

On motion, the Board adjourned, *sine die.*

REVERE HOUSE, DECATUR,
September 28, 1863—7½, *P. M.*

Pursuant to call of the President, the Executive Committee met, as above.

Present: President Van Epps, Vice Presidents Mattson, Holder, Rosenstiel, Singleton, McConnell, Kile, Wait, Ozburn; Ex-Presidents Webster and Brown; also, John W. Bunn, Treasurer, and John P. Reynolds, Corresponding Secretary.

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The President presented the matter of admitting the officers of the Macon County Agricultural Society, with their families and carriages, free of charge, during the Fair.

On motion of General Singleton, a resolution to the effect that they be so admitted, was passed.

On motion of Mr. McConnell, C. J. Reynolds, of Dixon, was appointed to the position of Superintendent of Class A, for the Fair, in the absence of Mr. Whiting.

On motion of Gen. Singleton,

Resolved, **That a Lot be opened for draft horses of the same numbers and amount of premiums as those offered for roadsters, and that the Corresponding Secretary be and he is hereby instructed to arrange the books, with reference to such Lot.**

On motion, Messrs. McConnell, Kile and Holder, were appointed a committee to confer with the officers of the Macon County Agricultural Society, in regard to admitting those holding complimentary tickets of this Society, to the amphitheater, free of charge; also, to communicate to the officers of the Macon County Agricultural Society the action of the Executive Committee, in regard to admitting the families and carriages of said officers to the Grounds.

On motion of Dr. Kile,

Resolved, **That John W. Bunn, Treasurer, be appointed a committee of one, to take final action on the question of admitting shows to the Fair Grounds.**

On motion of Gen. Singleton,

Resolved, **That a premium of a ladies' riding saddle, worth not more than fifty dollars, ($50,) be offered for the best specimen of Ladies' Equestrianism, to be decided on Wednesday, September 30, at 4, P. M.—five entries to require the award of a premium.**

Mr. Webster having been called to the chair, President Van Epps moved to instruct Mr. Bunn not to admit shows to the Grounds.

On motion of Gen. Singleton, the motion of Mr. Van Epps was laid on the table.

On motion of Mr. Holder, the vote by which the resolution of Dr. Kile, creating the committee of one, on the subject of admitting shows to the Fair Grounds was passed, was re-considered; and, on motion of Gen. Singleton, the resolution of Dr. Kile was laid on the table; whereupon, on motion, the President was constituted a committee to determine the question of admitting shows to the Grounds, and to report at the next meeting of the Executive Committee.

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REVERE HOUSE, DECATUR,
September 30, 1863—7, *P. M.*

The Executive Committee met, pursuant to adjournment.

Present: President Van Epps, Vice Presidents Rosenstiel, Holder, McConnell, Kile; Ex-Presidents Webster and Brown.

On motion of Mr. McConnell, the Superintendent of Class "I," was instructed to vary, at his discretion, the rules applicable to his Department, in regard to the awards by committees.

On motion of Dr. Kile,

Resolved, That the President, and any other members of the Executive Committee he may select, be requested to make up, by appointment, to the full number, the Committees on Cattle.

On motion, the Executive Committee adjourned until to-morrow, at 7, P. M.

(No other formal meeting of the Board was held during the Fair.)

ROOMS OF THE ILLINOIS STATE AGRICULTURAL SOCIETY,
Springfield, *January* 8, 1864.

The time fixed for the meeting of the Committee was Tuesday, January 5th, but owing to the great snow storm, which seriously interrupted the communication by railway throughout the whole State, and entirely blockaded it throughout the northern half for several days, there was not a quorum present.

The Farmers' Convention engaged the attention of all who were here, until noon of January 8, when it was deemed advisable to organize the Executive Committee and proceed with such matters of business as could not properly be deferred to a subsequent meeting—such action as might be taken, to be subject, of course, to review in full Board. Accordingly, at 2, P. M., President Van Epps assumed the chair, and called the Committee to order.

By consent, Dr. Schroeder, of Bloomington, read his statement on Market Gardening, illustrating his practice of that art; at the conclusion of which, the Corresponding Secretary read the statement of S. W. Arnold, of Cortland, DeKalb county, on the same subject.

After hearing these statements, the premium offered by the Society for the best Market Garden, was awarded to Dr. Schroeder.

Suggestions made by Dr. Schroeder, in the course of his statements, and the remarks accompanying them, directed the attention of the members of the Committee to the propriety and the necessity of encouraging the immigration of the industrious laboring population of Europe to this State; and, accordingly, the Corresponding Secretary prepared and submitted the following preamble and resolution, which were unanimously adopted:

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WHEREAS, There are in this State thousands of acres of land of the greatest natural fertility, admirably adapted to the production of almost every variety of fruit, grain and vegetable, grown in the temperate latitudes of the earth, lying within the reach of excellent markets, over an already completed system of railroads and canals;

AND, WHEREAS, These lands, with all their adaptability, by reason of their location and quality, to the support of a dense population, are now to be purchased at very low prices, in parcels to suit purchasers, and on long time;

AND, WHEREAS, We believe that by properly presenting these and other facts, illustrative of them, to the laboring population of Europe, and especially to those of the German Provinces, immigration would be encouraged, the condition of the laborer improved, and the wealth and prosperity of the State be largely added to; therefore,

Resolved, That we hereby recommend to the Germans and other foreigners, resident in Illinois, to form an Industrial Association, the object of which shall be to collect facts, statistical and other, bearing upon this subject, and present them, in such form as may seem best, to their brethren and friends in Germany and other parts of Europe.

On motion, adjourned until 9, A. M., to-morrow.

January 9, 1864—9, *A. M.*

Board met, pursuant to adjournment.

Present, as on yesterday.

By consent, the award of premiums on Essays was proceeded with. (The awards will be found in the proper place in this volume.)

The exhibition of native wines was very creditable, and, besides those taking premiums, some excellent samples of Catawba, Concord and Norton's Virginia Seedling wine, were presented, though not in competition for premiums, by Mr. Eisenmeyer and Mr. Englemann, of St. Clair county. These latter were believed, by the Board, to be the best samples on exhibition—those of Dr. Schroeder seeming to have received an addition of more sugar than is properly allowed to be added in those wines for which purity is claimed.

The awards on Sugars and Sirups were postponed to next meeting of the Board.

On motion of Mr. Whiting,

Resolved, That the Executive Committee hereby tender to Prof. C. D. Wilber, Secretary of the Illinois State Natural History Society, their thanks for a copy of his map of Illinois, just published, and embodying Geographical, Geological, Topographical, Meteorological, Botanical and Statistical information, of great value to farmers and other citizens, not to be found elsewhere, in a form so convenient for reference.

Resolved, That we fully appreciate and commend the efforts of the Illinois State Natural History Society, and its Secretary, Prof. Wilber, to diffuse, by means of popular lectures, publications and otherwise, a correct knowledge of the mineral and other resources of this State.

On motion of Mr. McConnell,

Resolved, That justice to the interest of the wool growers of the United States demands

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of this Society to take place at the next Fair, and earnestly urging upon each of them the appointment of three delegates for that purpose.

On motion, the Executive Committee adjourned to meet on the 1st day of March next.

AGRICULTURAL ROOMS,
Springfield, Ill., March 1, 1864.

The Executive Committee met, pursuant to adjournment.

Present: President Van Epps, Messrs. Rosenstiel, McConnell, Kile, Wait and Ozburn.

The minutes of last meeting were read and approved.

On motion,

Resolved, That the action of the Committee, at the last meeting, there having been no quorum present at that time, be and it is hereby ratified and approved.

Mr. J. H. Pickrell, Superintendent of Grounds at the last Fair, read his report. The consideration of the suggestions contained therein, was deferred to some subsequent day of the present meeting.

The Corresponding Secretary read a communication from the Macon County Agricultural Society, in regard to the enlargement and re-arrangement of the Premium List, and asking the Committee to refund certain money awarded as "Citizens' Prizes," which, on motion of Dr. Kile, was deferred for consideration at a subsequent day of the present meeting.

The essays of Prof. Sewell, on "Some of the Chemical Changes which take place in the Germination, Growth and Decay of Plants," and of President Edwards on "Agricultural Education," were read and highly commended, and ordered to be filed for publication.

A communication from Mr. Wallace Sigerson, was also read, suggesting the propriety of the passage of a law, by the General Assembly of Illinois, requiring all stock to be kept within inclosures, and thus dispensing with the necessity of fencing in the State, except for the purposes named; which, on motion, was referred to a committee, consisting of Messrs. Kile, Rosenstiel and Ozburn, with instructions to report at some time during the present meeting.

The communication of Mr. William D. Wilson, in regard to compensation for making the Descriptive Report of the Implements on exhibition at the last Fair, was read, and referred to the President and Mr. Wait.

On motion of Dr. Kile,

Resolved, That medals (gold and silver) be executed and forwarded to the parties entitled to them, under the awards heretofore made, and that in all cases where a diploma has been heretofore awarded a silver medal be tendered in lieu thereof.

On motion of Mr. Rosenstiel, Dr. Kile and the Corresponding Secretary were appointed a Committee to visit the Indiana State Fair, the current year.

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Revere House, Decatur,
July 27, 1864—11, A. M.

[illegible] Presidents Dr. Kile, Wm. [illegible] Holder; also, Ex-Presidents C. [illegible] Treasurer, John W. Bunn, and [illegible] Reynolds.

[illegible] following letter from John R. Woods, [illegible] State Sanitary Commission, asking as- [illegible] to the Sanitary Commission

[illegible] Headquarters, State of Illinois,
[illegible] General's Office, Sanitary Department,
Springfield, July 12, 1864.

[illegible] Decatur, Illinois.

[illegible] the Directors of the Illinois Sanitary [illegible] Illinois State Agricultural Society, [illegible] the said Board wish to adopt for the [illegible] with all the vigor and efficiency posse- [illegible] The plan which we favor is, substan- [illegible] those people who design to be exhibitors [illegible] Sanitary cause. These articles, with [illegible] other departments. The donated articles [illegible] disposition to be made of [illegible] the property of the Commission, and [illegible] No arrangement to be made—no step [illegible] interfere with the interests or receipts of [illegible] and favorable response,

I am, respectfully, yours,
JOHN R. WOODS,
Secretary Illinois Sanitary Commission.

[illegible] for the use of the said Commission, having [illegible] Committees to visit the various Depart- [illegible] private, and generally conduct the [illegible] their own way, only that the arrange- [illegible] shall not be interfered with, and that [illegible] to the State Sanitary Commission.

[illegible] appointed a Committee to admit [illegible] exhibitions, and to fix the rate for ad- [illegible]

[illegible] a Committee to employ [illegible]

[illegible] by Mr. Hall to furnish [illegible] make arrangements with [illegible] suitable hall [illegible]

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Ordered, That the General Superintendent be required to have the Society's tent repaired and erected on the Fair Grounds, for the use of visitors during the Fair.

On motion, adjourned to meet at the Fair Grounds, at 2, P. M.

FAIR GROUNDS, DECATUR,
July 27, 1864—2, *P. M.*

Board met, and examined the structures and general condition of the Grounds, in company with several of the Directors of the Macon County Agricultural Society; and, after giving such directions and making such suggestions, for preparing the Halls, fixtures, etc., as were deemed necessary, for the coming Fair, adjourned, *sine die.*

PRESIDENT'S OFFICE, FAIR GROUNDS,
Decatur, *September* 13, 1864—10, *A. M.*

Pursuant to call of the President, the Board met at his office, on the Grounds.

On motion of Dr. Kile, C. W. Webster and H. Prather were empowered to appoint the Awarding Committees on Citizens' Prizes.

President Van Epps presented the following letter from Gen. John Cook, Recording Secretary, which was ordered on file:

MILWAUKEE, WISCONSIN, *September* 10, 1864.

HON. WM. H. VAN EPPS, *President Illinois State Agricultural Society:*

DEAR SIR: It is with feelings of deepest regret, that circumstances over which I have no control, preclude the possibility of my participating in the proceedings of our Society, during its Twelfth Annual Exhibition, at Decatur. I hoped to be allowed the privilege of meeting the highly esteemed friends composing our Agricultural Board, with whom, under all circumstances and upon all occasions, I have been most proud to be recognized as an humble co-laborer in the development of the boundless wealth of our Agricultural and Mechanical resources; but war, (the wickedest of rebellions,) with its unyielding tenacious discipline, has, for the time being, separated us, yet, with a firm conviction of ultimate success to the cause of the Union, "the whole Union, and nothing but the Union," I am permitted to hope that the time is not far distant when the "sword will be converted into the plow share and the spear into the pruning hook," and our now distracted country under a *permanent and honorable peace*, again assume her exalted position among the nations of the earth. When this is consummated, I hope again to join you at the annual of civil and industrial [illegible]

On motion of Dr. Kile, the President and Messrs. Mattson and Whiting, were appointed delegates to the Iowa State Fair, for 1864; and Messrs. Ellsworth, Rosenstiel and Holder, delegates to the Wisconsin State Fair, for 1864; also, Messrs. Wait, Ozburn and Singleton, to the Missouri State Fair, for 1864.

On motion, adjourned until 8, A. M., to-morrow.

March 2, 1864.

The Committee met, pursuant to adjournment.

Present: President Van Epps, Messrs. Kile, Ozburn, Rosenstiel, Wait and McConnell.

The Corresponding Secretary read a communication from J. H. Pickrell and J. G. Taylor, on behalf of a Committee of the Macon County Agricultural State Society, setting forth the condition of said Society in regard to the large liabilities incurred in fitting up the Fair Grounds, and asking that the State Society appropriate a certain portion of the gate fees of the next Fair to the use and relief of said County Society. The same having been discussed and duly considered, it was, on motion of Dr. Kile,

Resolved, unanimously, That the price of single admission tickets for the State Fair of 1864, be fixed at thirty cents each; and in consideration of the very large expenditure made by the Macon County Agricultural Society, in preparing and fitting up the Fair Grounds, for the use of the said State Agricultural Society, the said State Society will donate to the said County Society, five cents on each single admission ticket sold during the next Fair, to aid them in liquidating their indebtedness, incurred as aforesaid.

The communication from the officers of the Macon County Agricultural Society, which was read yesterday, was taken up, and, after some discussion, it was, on motion,

Resolved, That this Society relinquish to the Macon County Agricultural Society, all claim to the fines which may be assessed and collected during the Fair of 1864.

Resolved, That the Treasurer of this Society be and he is hereby directed to refund to the Macon County Agricultural Society, one hundred and seventy-five dollars, ($175,) erroneously paid on Citizens' Prize at the late Fair of this Society.

The subject of awarding premiums on sirup and on dairy products, was then, by consent, taken up; and, after examination, the awards were made. (See report in proper place in this volume.)

The Treasurer, John W. Bunn, presented his report for 1863, showing a balance in the Treasurer's hands, in favor of the Society, on the 1st of January, 1864, of $2,033 11; which report, on motion, was ordered to be placed on file.

Lyman Chapin, by consent of the Committee, made a statement of the occurrence on the Fair Grounds, last fall, by which his stal-

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The following resolutions were, on motion, unanimously adopted:

Resolved, That the United States Department of Agriculture, in the efforts put forth to diffuse needed information among the farmers, is entitled to our decided approval.

Resolved, That its continued existence, with increasing power, having been maintained for nearly two years in an atmosphere teeming with adverse and unfriendly influences, impresses us with the hope that at some time in the future of our progressive race and nation, the politicians of the country will be driven, willingly or unwillingly, to recognize the fact, already apparent to the rest of mankind, that to Agriculture and Mechanic Arts this people must mainly look for progress in all that conduces to the material wealth and prosperity of the United States.

Resolved, That we tender to the present head of that Department, his chief clerk, and their successors, the assurance that the Northwest will always be ready to acknowledge the value of their labors and extend to them whatever of influence they may possess, to assist in enlarging the sphere of usefulness of the Department, and to increase its efficiency.

Resolved, That the Corresponding Secretary be instructed to transmit a copy of the foregoing resolutions to the Hon. Isaac Newton.

James N. Brown, to whom, as the Standing Committee on the subject, was referred letters and communications from Governor Yates, in regard to Pleuro Pneumonia, made a statement as to the continued prevalence of the disease in Massachusetts, and the danger of its introduction into the herds of the West. After a full consideration and discussion of the subject, the following Committee was appointed to confer with Governor Yates, in relation to the best course to be pursued and necessary to be adopted, to guard against its introduction into this State: J. N. Brown, A. B. McConnell and the Corresponding Secretary.

On motion,

Resolved, That the report of James N. Brown, on the subject of Pleuro Pneumonia be published in the first number of the Society's "Journal," for 1864.

By consent, the Miscellaneous Entries, at the Fair of 1863, were examined and the recommendations of the various Awarding Committees passed upon.

By consent, the matter of the injury to Mr. Chapin's stallion was again taken up, and having been canvassed; it was,

On motion,

Resolved, That the further consideration of the subject be indefinitely postponed.

On motion, the Premium List for 1864, was then taken up and considered until half-past eleven o'clock, P. M., when, on motion, the Committee adjourned until 8, A. M., to-morrow.

March 3, 1864—8, *A. M.*

The Executive Committee met, pursuant to adjournment.

Present: President Van Epps and Messrs. Kile, Wait, Ozburn, Rosenstiel and McConnell; also, James N. Brown, of the Board of Counselors.

On motion, the further preparation of the Premium List was proceeded with, and, having been completed, the Board adjourned to meet on call of the President.

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REVERE HOUSE, DECATUR,
July 27, 1864—11, *A. M.*

Pursuant to call of the President,

The Executive Committee met.

Present: President Van Epps, Vice Presidents Dr. Kile, Wm. S. Wait, A. B. McConnell, R. H. Holder; also, Ex-Presidents C. W. Webster and H. C. Johns; the Treasurer, John W. Bunn, and Corresponding Secretary, John P. Reynolds.

The President presented the following letter from John R. Woods, Recording Secretary of the State Sanitary Commission, asking assent to a plan for obtaining donations to the Sanitary Commission during the Fair:

GENERAL HEADQUARTERS, STATE OF ILLINOIS,
ADJUTANT GENERAL'S OFFICE, SANITARY DEPARTMENT,
Springfield, July 12, 1864.

HON. WILLIAM H. VAN EPPS,
President Illinois State Agricultural Society, Dixon, Illinois.

DEAR SIR: It is made my duty, by recent action of the Directors of the Illinois Sanitary Commission, to apply to the Executive Board of the Illinois State Agricultural Society, for their assent to and approval of a measure which the said Board wish to adopt for the purpose of increasing our facilities for prosecuting, with all the vigor and efficiency possible, the Sanitary work which we have undertaken. The plan which we favor is, substantially, as follows, viz: To solicit, by circular, of those people who design to be exhibitors at our next State Fair, donations of articles for the Sanitary cause. These articles, with others, to be exhibited for premiums in their proper Departments. The donated articles to have an additional card, with the price, and indicating the disposition to be made of them. After the awards, those articles to become the property of the Commission, and sold at private or public sale, on a day of the Fair. No arrangement to be made—no step to be taken—that will, in anywise, conflict or interfere with the interests or receipts of the Agricultural Society.

Hoping to receive an early and favorable response,
I am, respectfully, yours,
JOHN R. WOODS,
Secretary Illinois Sanitary Commission.

Ordered, That a plat of ground be assigned for the use of the said Commission, during the Fair.

Ordered, That they have permission to appoint Committees to visit the various Departments, to solicit donations, conduct sales, (public or private,) and generally conduct the Sanitary Department, within the assigned limits, in their own way, only that the arrangements of the State Agricultural Society for the Fair shall not be interfered with, and that the Corresponding Secretary communicate this action to the State Sanitary Commission.

On motion of Dr. Kile,

Resolved, That R. H. Holder and John W. Bunn, be appointed a Committee to admit or reject, as they may think proper, all side shows or exhibitions, and to fix the rates for exhibition, and the places for the same.

On motion, Mr. Holder was appointed a Committee to employ a sprinkler for the Fair.

The President stated a proposition made by Mr. Hull, to furnish music for the Fair, and was authorized to make arrangements with that, or any other gentleman, to furnish a suitable band of music.

On motion,

Ordered, That Dr. Kile be authorized to make the necessary arrangements for the erection of a Power Hall, and to furnish an engine and shafting for use during the Fair.

Ordered, That the President and Secretary be appointed a committee to confer with the citizens and parties in Macon county, in regard to the matter of "Citizens' Prizes," and to conclude arrangements for the same.

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Ordered, That the General Superintendent be required to have the Society's tent repaired and erected on the Fair Grounds, for the use of visitors during the Fair.

On motion, adjourned to meet at the Fair Grounds, at 2, P. M.

FAIR GROUNDS, DECATUR,
July 27, 1864—2, *P. M.*

Board met, and examined the structures and general condition of the Grounds, in company with several of the Directors of the Macon County Agricultural Society; and, after giving such directions and making such suggestions, for preparing the Halls, fixtures, etc., as were deemed necessary, for the coming Fair, adjourned, *sine die.*

PRESIDENT'S OFFICE, FAIR GROUNDS,
Decatur, September 13, 1864—10, *A. M.*

Pursuant to call of the President, the Board met at his office, on the Grounds.

On motion of Dr. Kile, C. W. Webster and H. Prather were empowered to appoint the Awarding Committees on Citizens' Prizes.

President Van Epps presented the following letter from Gen. John Cook, Recording Secretary, which was ordered on file:

MILWAUKEE, WISCONSIN, *September* 10, 1864.

HON. WM. H. VAN EPPS, *President Illinois State Agricultural Society:*

DEAR SIR: It is with feelings of deepest regret, that circumstances over which I have no control, preclude the possibility of my participating in the proceedings of our Society, during its Twelfth Annual Exhibition, at Decatur. I hoped to be allowed the privilege of meeting the highly esteemed friends composing our Agricultural Board, with whom, under all circumstances and upon all occasions, I have been most proud to be recognized as an humble co-laborer in the development of the boundless wealth of our Agricultural and Mechanical resources; but war, (the wickedest of rebellions,) with its unyielding though just discipline, has, for the time being, separated us, yet, with a firm conviction of ultimate success to the cause of the Union, "the whole Union, and nothing but the Union," I am permitted to hope that the time is not far distant when the "sword will be converted into the plow share and the spear into the pruning hook," and our now distracted country, under a *permanent and honorable peace*, again assume her exalted position among the nations of the earth. When this is consummated, I hope again to join you in the labors of civil and industrial pursuits, contributing my mite towards placing our glorious State first in Agriculture as she is now first in unalloyed patriotism and devotion to the Constitution and the Union.

With every assurance that your efforts will be crowned with the completest success, and your labors meet the rich reward they so justly deserve, together with the warmest regards to every member of the Board,

I have the honor to be your most obdedient servant,

JOHN COOK,
Rec. Sec'y I. S. A. S.

After the reading of which, the President proceeded to formally inaugurate the Fair of 1864, by delivering the following

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OPENING ADDRESS:

Fellow Citizens: In behalf of the Association I have the honor to represent, permit me to extend to you, the Delegates from kindred associations in this and other States—the officers and members of this Society, as well as exhibitors and visitors, a cordial welcome to this, the Twelfth Annual Exhibition of our State Agricultural Society.

As citizens of this State we have many causes for congratulation. The invitation of the Executive Board has been nobly responded to, and, at the present stage of its progress, this Fair promises to be one of the largest and most successful, as it certainly is, in some respects, the most important and significant, of the whole triumphant series.

Already are these Halls and beautiful grounds filled with the choicest products of Industry and Art. The grounds and structures themselves form an enduring monument to the genius and taste and enterprise of the members of the Macon County Agricultural Society, who have thus placed the whole State under lasting obligations and set before other localities an example eminently worthy of imitation.

I congratulate you again, upon the general prosperity which attends every legitimate branch of Agriculture and the Mechanic Arts. Nothing in the wonderful growth of the State prior to 1860, has equaled the rapid progress since. Will the historian who shall record the simple facts as they are transpiring now, be credited by those who come after us?

Look all over these prairies and observe everywhere the life and activity prevailing. See the railroads pressed beyond their capacity with the freights of our people, the Metropolis of the State rearing its stately blocks with a rapidity almost fabulous, and whitening the northern lakes with the sails of its commerce; every smaller city, town, village and hamlet within our borders all astir with improvement—every factory, mill and machine shop running with its full complement of hands—the hum of industry in every household—more acres of fertile land under culture, fuller granaries and more prolific fields than ever before—in short, observe that this State and this people of Illinois are making more rapid progress in population, development, wealth, education and in all the arts of peace than at any former period, and then realize, if you can, that all this has occurred and is occurring in the midst of a war the most

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thousands of farmers and artizans with their families assembled to spend a week in learning new lessons of life, to exchange thoughts and courtesies, and, I trust, to pledge themselves anew to the maintenance of those principles of government, and true democratic social conditions, which, under the smiles of Providence have enabled us to realize all these blessings, and then reflect that all this has been nursed and brought to pass *in the fourth year of a civil war!*—and that Illinois has furnished to the Union Armies about one hundred and eighty thousand able-bodied sons, or one-tenth of her entire population in 1860! Where, but in free America, in the Great West, and, shall I say, in the Prairie State, need we look for a parallel?

On the 5th day of January, 1853, the Society holding this Exhibition was born. Its parentage is most worthy; and many, if not most of the large-hearted, clear-headed gentlemen who officiated and conducted the ceremonies on that occasion have been kindly dealt with and are now present with us.

Its career, though not yet in its "teens," has, there is reason to believe, been one of incalculable usefulness, and its efforts, in conjunction with the State Horticultural and other kindred Associations, have kept pace with and in a large degree promoted the miraculous growth and development of the State itself. Whether all has been accomplished that might have been, it is not necessary to discuss.

Its history is of record down to the close of 1860—as well in published volumes as in the unpublished traces of Agricultural and Mechanical improvement all over the State.

More from indifference, almost as culpable as downright opposition, on the part of the Legislature, than from any other cause, the resolution to print the fifth biennial volume of Transactions, failed to pass the Senate, having previously passed the House of Representatives, and hence the material of great value remains in the hands of the Corresponding Secretary.

No such misfortune is likely again to occur, and there is no reason to doubt that the necessary legislation will be had at an early day of the next session.

I shall not attempt to even enumerate the special efforts of the Executive Board to meet the responsibilities which have rested upon them during the past four years, but will barely refer to some of them.

It will be remembered that the condition of the country changed from peace to war in the spring of 1861. Large armies were marshaled and thoughtful and wise men supposed that all branches of industry, and especially Agriculture, from whose fields the soldiers of the Union must come, would be paralyzed, and that the old historical companion of civil strife—*famine*—would soon be felt in the land. The question of food supply became at once the most important, and accepting the responsibility of their position, the Board immediately directed the machinery of the Society to stimulating

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the invention of labor-saving farm implements. The amount, theretofore offered in premiums in the Mechanical Department was more than trebled, and those who saw it will long remember the display of implements and machinery at the Fair of that year in Chicago, as far more extensive than any of its predecessors.

In the following year, at Dixon, was held a field trial of Harvesting Machinery, pronounced by competent judges more complete in its conduct and arrangements than any before that time held in the United States. The list of competitors was large, and of the results we may speak without boasting. Those implements, covering yon beautiful slope, are, in many of their best and most important devices, so many fruits of that Exhibition, elaborated and brought to perfection by the intelligence, ingenuity and enterprise of their worthy inventors.

In 1863, at this city, the Board held another field trial, confined chiefly to implements used in the preparation of the soil and the after-culture of crops—not less successful nor less decisive in its results than the former. Nearly everything presented for trial was new. On some of the implements the paint of the shop was scarcely dry before they were wheeled into line for competition, while very few were more than one or two years old even in the brains of their inventors. Mark the revolution which has followed their introduction: What required two able-bodied men, at the cost of much muscular exertion, to perform, three years since, may now be done, and has been done the past summer, attended with no physical exertion save that of riding or driving a team, by a boy of fifteen or an old man of sixty—thus vastly lessening the drudgery of farm life and correspondingly reducing the cost of production. This is but one of the many triumphs of similar character witnessed on our smooth prairie fields within a very brief period.

One of the most significant facts as illustrating the importance attached by our inventors to the improvements designed to save manual labor in the field, is stated in the Preliminary Report of the United States Patent Office for 1863. Of inventions during that year, in fire-arms, there were 240; in improvement of Implements of Agriculture 490, or more than double—and this, too, in time of war!

All honor, then, to our noble Inventors and Mechanics who are thus benefiting their fellow men and weaving bright chaplets on the brow of American Genius.

But the most cheering and important view of this saving of labor has not been adverted to. How many hours of toil will it save to the industrial classes to be applied to the culture of the mental and

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of public lands by Congress to the several States for the "endowment, support and maintenance of at least one College, where the leading object shall be * * * * * * to teach such branches of learning as are related to Agriculture and the Mechanic Arts," assumes a new beauty and more impressive meaning.

EDUCATE ALL, *and then all who work with their hands will know also how to work with their brains.* This is the true American view of the question—the accepted creed, being rapidly reduced to practice.

Inspired with this noble and ennobling idea, with far-seeing wisdom and a living philanthropy, some gentlemen of this State, as early as 1851, agitated and discussed on all occasions the propriety of the endowment, from the sales of public lands or direct appropriation by the General Government, of Colleges in the several States for the education of the Industrial Classes.

I will not attempt to follow those gentlemen and best of patriots in their early struggles to win the ear of an unwilling public and the respectful attention of less willing politicians controlling the legislation of the country. They, however, succeeded at last, and to-day the people of every State may, if they will, avail themselves of the beneficent results of their labors.

Upon this subject I desire to say a few words to those here assembled.

It concerns us all, and is one upon which, in some form or other, we must individually act. It is, therefore, important that we obtain correct views of our rights and duties in relation to it.

Desiring to be perfectly understood, I shall speak plainly:

You are all aware that our Educational system is made up of,

1st—The Common Schools—adapted, or intended to be, to the wants of all alike; and,

2d—Seminaries, Colleges and Universities.

The first are a modern invention and have not been, nor can they be, sustained in purity and usefulness except among a people whose ideas—whatever may be the form of their government—are essentially democratic. They are designed to furnish the means whereby the whole people may acquire that general intelligence without which they are not capable of self-government.

The second are "old as the hills"—originally created and established in the interest of an educated aristocracy, devoted to the so-called learned professions; descended to us with some modifications, but, in the main, inheriting the diseases contracted centuries back under the class legislation of European monarchies, and retaining the same old trammels, and ligatures, and systems.

To a certain extent and in a sort of a way, they still manage, even in the free air of the New World, to accomplish the original purpose of their establishment; they give birth periodically to pupils fitted or designed for the professions, and, to a very great extent, unfitted for any other useful pursuit. Such, with a few bright, progressive exceptions, are the present American Colleges and Uni-

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versities—hardly so well adapted to the education of pupils for any industrial avocation in this State, at the present time, as would be the rude implements of ancient Egyptian Agriculture to the wants and purposes of the Illinois farmer of this day.

When shall we cease to expect "to gather figs from thistles?" Certainly never, until we cease to hope from our so-called higher Institutions of learning, as at present conducted, a training for their pupils which shall fit them for the duties of any other than a professional life.

In Illinois, I learn, there are near thirty of these Institutions, well endowed and provided with professors of eminent ability, who, by their devotion, their general intelligence and common sense, succeed in accomplishing as much good and as little harm as any similar number could be expected to accomplish when bound hand and foot, mind and body, and delivered over as slaves to the systems and ideas of ages long past.

That they realize, to some extent, the condition in which these obstacles to progress have placed them, is manifest from the effort being made by many having in charge these Literary Colleges, to popularize them by adding at least one modern feature—an Agricultural Department—to their present organization—hoping to vivify the fossil by placing in the same case a living specimen of a modern species!

Perhaps the most barbarous, loathsome punishment ever inflicted on humanity is that by which the living victim is bound to a dead carcass and left to the lingering torture. Scarcely less repulsive, to my mind, is the attempt to throw around the bright, healthy offspring of the Nineteenth Century—the educational system modernized and adapted to the daily, hourly wants of the whole people—the old monkish claws of the schoolmen; and while the attempt itself affords promise in so far as it is an acknowledgment that those Institutions are at last waking up to a consciousness of their own imperfection, the success of such an attempt would be most deplorable.

The great mass of the citizens of this State are, and must always be, workers—perform manual as well as mental labor.

Agriculture and Mechanic Arts are the leading pursuits of those who perform this manual labor.

Success in either of these requires a training of mind and body for as long a period as is usually devoted by the professional student to the acquisition of his profession.

There is not, as yet, a single College or Institution of any kind in operation in this State where the course of instruction is calculated to meet the wants of one whose purpose it is to follow in after life either of these branches of industry.

The grant of lands by Congress to the several States was intended to provide in part for this great need. No man can read the law making the grant or understand the history of the movement out of which it grew without feeling that those who expect to become mem-

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bers of the so-called Industrial Classes are to be its beneficiaries—that the College or Colleges established and maintained by the fund arising from this source must have for their "LEADING object" "to teach such branches of learning as are related to Agriculture and the Mechanic Arts." Any other application of the fund will amount to a total perversion of the intention of Congress, and ought to work a forfeiture of the grant itself.

A word to those who represent the two branches of industry named. This grant is designed for the benefit of both alike, and not of either alone. Let there be no quarrel between you. Act together in this matter as your relations to each other indicate you should. Be not *divided*, and thus more easily *conquered*. Determine that, as Agriculture and the Mechanic Arts are co-laborers in life and joint heirs in this bequest, so there shall be one College in this State devoted to the training of pupils for these pursuits; and, as the only practical way of accomplishing this, see to it that your members of the General Assembly for the coming year understand your wishes and may be relied upon to act and vote in this matter as you know to be required by the best interests of the people of this and all succeeding generations.

I have been prompted to these remarks by observing, as you have doubtless done, the occasional development of some scheme to divert this Congressional grant to ends less useful than those for the accomplishment of which it was originally intended. If I have impressed upon your minds the necessity of vigilance and prompt concerted action, my purpose is attained.

In conclusion, I desire to tender the sincere thanks of the Executive Board to the various railroad companies of the State for the many favors and courtesies extended to the Society during the past four years; to the gentlemen of the press, without whose labors much that is valuable in these Annual Exhibitions would have been lost to the world, or, at least, confined to the knowledge of those attending them, and to the Chief and Assistants of the National Department of Agriculture who are demonstrating how valuable an ally of the industrial interests of the nation the Department may become.

May this occasion be one of permanent, substantial benefit to those who share its pleasures—and no one go hence without having learned some lesson or gained some thought which shall prove a treasure in after life.

On motion, Board adjourned, to meet on call of the President.

FAIR GROUNDS, DECATUR, OFFICE OF RECORDING SECRETARY,
September 14, 1864—6, *P. M.*

In accordance with the requirements of the Constitution of the Society, President Van Epps called to order the meeting of dele-

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gates from the legally organized County Agricultural Societies of the State, assembled for the election of officers of the State Agricultural Society, for the ensuing two years, 1865 and 1866.

The Corresponding Secretary had, previously, by circular, March 8, 1864, duly notified the officers of the County Societies of the approaching election, urging upon them the importance of being represented; and, on calling the counties, the following delegates presented their credentials:

Adams—K. K. Jones, Frederick Prevost, Washington Corbyn.
Champaign—S. Busey, A. G. Carle, M. L. Dunlap.
Cook—David A. Gage, Jonathan Periam, Milton S. Patrick.
DeKalb—J. W. Smull, Moses Dean, N. Saum.
Douglas—Caleb Garret, A. W. Hess, I. J. Halstead.
Gallatin—Joseph F. Ballinger, George W. Davis, George L. Burrers.
Grundy—O. B. Galusha, S. W. Bushnell, Joseph R. Opdyke.
Henderson—A. L. Porter, David Mundorff, Wm. L. Stockton.
Jackson—S. S. Hall, B. F. Will, Philip Kimmel.
Kankakee—Emery Cobb, W. C. Richards, Slocum Wilber.
Knox—A. W. Martin, B. S. West, W. P. Sisson.
Lee—Abijah Powers, Abram Brown, Joseph T. Little.
Logan—Ellis Dillon, R. W. Burt, S. D. Fisher.
Macon—J. H. Pickrell.
Macoupin—W. C. Waters, David Gore, John Tunnell.
Montgomery—Andrew Bloss, Jacob Cress, Paul Walters.
Morgan—M. C. Goltra, Joseph Morton, Col. Roberts.
Peoria—E. H. Clapp, C. C. Wood, Columbus Deenhour.
Perry—B. G. Roots, Amos Saunders.
Putnam—W. A. Pennell, Joshua Mills, H. B. Leeper.
Sangamon—James N. Brown, J. A. Pickrell, A. M. Garland.
St. Clair—S. B. Chandler, R. W. Lemen.
Stephenson—Charles H. Rosenstiel, D. H. Sunderland, Harrison Diemer.
Tazewell—G. W. Minier, W. W. Dean, Seth Talbot.
Union—J. A. Carpenter, Wm. Kimmel, T. K. Walton.
Vermilion—Peleg Spencer, C. L. Pate, Wm. Sandusky.
Wabash—Thomas Rigg, C. Bredwell, Wm. C. Deputy.
Warren—N. A. Rankin, Charles Corwin.
Winnebago—Richard Jackson, D. S. Pardee, G. H. Mariner.

On motion of K. K. Jones, it was

Ordered, That each County Society, represented by one or more delegates, shall be entitled to cast three votes on this election.

Other delegates than those named above, were accepted by the meeting, as representatives of the Agricultural Societies of their respective counties, so that the highest number of votes cast at any one ballot was 183; but the additional names were not reported to the Secretary.

The meeting then proceeded to the election of officers of the State Agricultural Society, with the following result:

President—A. B. McConnell, Springfield, Sangamon county.
Vice President State at large—John Wentworth, Chicago, Cook county.

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Treasurer—JOHN W. BUNN, Springfield, Sangamon county.
Corresponding and Recording Secretary—JOHN P. REYNOLDS, Springfield, Sangamon county.

On motion, adjourned, *sine die.*

AGRICULTURAL ROOMS,
Springfield, January 3, 1865—7, *P. M.*

The Executive Committee met, pursuant to the call of the President.

Present: President Van Epps, Messrs. Rosenstiel and Mattson; also, Messrs. Ellsworth and Brown, of the Board of Counselors.

No quorum being present, the reading of the minutes of the last meeting was, on motion, dispensed with until full meeting of the Committee.

The Corresponding Secretary read a letter from Dr. Kile, expressing his regret because he could not be present at this meeting, and the kindly remembrance in which he always held his connection with the Committee, etc.

On motion, adjourned until 9, A. M., to-morrow.

January 4, 1865—9, *A. M.*

Pursuant to adjournment, the Committee met.

Present: President Van Epps, Messrs. Ozburn, Rosenstiel, Mattson and McConnell; also, Messrs. Ellsworth, Brown and Johns, of the Board of Counselors.

On motion of Mr. Ellsworth, the reading of the minutes of the proceedings of the Executive Committee at the Fair was dispensed with, and the Secretary ordered to embody in them, for publication, the proceedings of the Convention of delegates from County Agricultural Societies, and the President's Opening Address, at the late Fair.

On motion, the Committee proceeded to the examination and consideration of Essays on the subject—"The Education of Farmers' Daughters,"—when the following were read:

One by Mrs. John R. Woods; one by Miss M. E. Murtfelt, and one by Charlotte Merrill.

The awarding of premiums was, on motion, temporarily postponed.

On motion, Miscellaneous Essays were taken up, and read as follows:

President Edwards, of the Normal University at Bloomington, on "An Agricultural College in Illinois."

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On motion,

Ordered, That the thanks of the Committee be tendered to President Edwards, for his able and valuable paper on the subject of "An Agricultural College in Illinois," and that he be requested to accept from the Committee, as a slight memento of their regard for his views, a volume on some subject connected with the interest he so ably discusses.

The subject of the Illinois Industrial University was taken up and discussed for some time, and then postponed until evening session.

On motion, adjourned until half-past 2 o'clock, P. M.

Half-past two o'clock, P. M.

The Committee met.

Present, as before.

The reading of Essays and Statements was continued.

The Statement of H. Schroeder, of Bloomington, on "Market Gardening," was read, approved, and the first premium awarded to the writer.

The Statement of Lucius C. Francis, of Sangamon county, on "Apple Orchards," was also read, approved, and the first premium awarded the writer.

The Essays on "Education of Farmers' Daughters," were again read and highly approved. A first premium was awarded to Mrs. John R. Woods, of Upper Alton, and a complimentary premium, of $10, to Miss M. E. Murtfelt, of Rockford, Illinois.

Messrs. Waters, Ballinger, Dorsey and Heaton, a Committee appointed by the Macoupin County Agricultural Society, presented, and, with the members of the Executive Committee, discussed the propriety of urging upon the Legislature the passage of a law for the protection of sheep, in this State, from the ravages of dogs; when, on motion of Mr. Ellsworth, it was

Resolved, That the passage of a general stringent law, by the Legislature of this State, for the purpose of diminishing, by suitable taxation, or otherwise, the ravages of dogs among the flocks of sheep in this State, is, in the opinion of this Committee, eminently necessary for the protection of the great and increasing sheep-raising and wool-growing interest.

The same gentlemen then presented the resolutions of the Macoupin County Agricultural Society, re-affirming the resolutions passed by a Convention of Farmers, held at Decatur, during the last State Fair, on the subject of the disposition of the Congressional land grant to the State for educational purposes, and protesting against the division of the fund to arise therefrom. They, also, urge that the College to be organized under and from the proceeds of that grant, be located centrally in the State.

The Executive Committee then took a recess until 7, P. M., when, on re-assembling, the subject of the Agricultural and Mechanical College was resumed, and earnestly discussed, resulting in the unan-

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imous approval of the act prepared by the Committee appointed by the public convention held last September, in Decatur, to draft and present to the appropriate Committee of the General Assembly, a law for organizing the same.

On motion, adjourned until to-morrow, at 9, A. M.

January 5, 1865—9, *A. M.*

The Executive Committee met.

Present, as before.

The subject of the appointment of the Commissioners to locate the Illinois Industrial University was taken up, and, after some discussion, it was, on motion,

Resolved, That the names of the Board of Counselors, and the Executive Committee, together with the names of the members elect of the incoming Executive Committee, be presented to the Governor—in case the bill prepared by the Decatur Committee should pass the General Assembly—as suitable persons from among whom to select the locating Commissioners, one being chosen from each Congressional district.

The award of premiums on fruits, wines, sirups and canned fruits was next proceeded with. (See report in the proper place in this volume.)

Mr. Schroeder, also, exhibited samples of five other varieties of grape wines; but, not having complied with the requirements of the Society, no premiums were awarded.

Mr. Thomas Bradbury, also, exhibited several varieties of wines from fruits other than grapes, on which special premiums were awarded.

The Miscellaneous Entries made at the last Fair, and the reports of the Awarding Committees were examined, and, in all cases where the Committees commended highly the articles entered, such commendations were confirmed, and the Corresponding Secretary instructed to include them in the publication of the awards at the Fair.

On motion, adjourned until to-morrow at 9, A. M.

January 6, 1865—9, *A. M.*

Pursuant to adjournment, the Committee met.

Present, as before, and Ex-President Webster.

The Treasurer, John W. Bunn, presented his report for 1864, which summed up, as follows:

Amount received from all sources for 1864	$23,434 82
" paid out on all accounts for 1864	18,120 74
Balance on hand	$ 5,314 08

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Messrs. Ozburn, Mattson and Rosenstiel, were appointed a Committee to examine said Treasurer's account, and vouchers therefor; which, having been done, they reported as follows:

The Committee, to whom was referred the Treasurer's report for 1864, beg leave to report that they have performed that duty, and find the account and vouchers to be correct, and we hereby express our approbation of the concise and complete, as well as the neat method in which the Treasurer keeps his books and performs his duty.

(Signed) H. S. OZBURN, *Chairman.*
C. H. ROSENSTIEL,
A. J. MATTSON.

The report of the Committee was received, and the Treasurer's report approved and ordered to be filed with the Corresponding Secretary.

The Secretary presented the subject of Statistics, referring to the series of Reports of the Ohio Commissioner of Statistics. Much interest was expressed by various members, when, on motion of Mr. Ellsworth,

Resolved, **That the Executive Committee is highly pleased with the recommendations of Governor Yates to the Legislature, touching the creation of a Statistical Bureau for this State, and express the earnest hope that the suggestion will be embodied in an efficient law at the present session of the General Assembly.**

Board took recess to 2, P. M.

Half-past two o'clock, P. M.

Executive Committee met.

Present, as before.

The Secretary laid before the Committee a communication from T. L. Loomis, Esq., suggesting the propriety of the Board urging upon the General Assembly the passage of a law enabling County Courts to make appropriations of money to County Agricultural Societies.

Having considered and discussed the subject at much length, it was finally concluded that the passage of a general law of this character would be likely to result in the repeal of the law donating $100, annually, by the State to County Societies, and, if it did so result, would work serious injury to Societies in counties where the County Courts were not sufficiently liberal.

The President laid before the Committee the bill of Mr. George W. Chatterton, for engraving medals; which was referred to Mr. Rosenstiel, who reported as due Mr. Chatterton, for engraving, (1,827 letters, at 2 cents per letter,) $36 55.

The Secretary having retired, by request, A. J. Mattson was appointed Secretary, *pro tem.*

On motion of Mr. Ellsworth,

Resolved, **That the Secretary is hereby instructed to prepare and complete the volume of Transactions, for the past four years, for publication, and to complete all business connected with his official position in this Board, up to January 8, 1865.**

On motion of Mr. Ozburn, the following was unanimously adopted:

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WHEREAS, Hon. John P. Reynolds, Corresponding Secretary of this Society, has discharged the duties of his office, for the past five years, to the entire satisfaction of this Board; and, whereas, the price of all articles, and necessary expenses of living have largely increased; therefore,

Resolved, That the salary of the said John P. Reynolds, as Corresponding Secretary, for the year just closed, (1864,) be increased one thousand dollars, making such salary twenty-five hundred dollars.

A. J. MATTSON, *Secretary, pro tem.*

On motion of A. J. Mattson,

Resolved, That in consideration of the untiring zeal and efficiency, in the discharge of their arduous duties by the retiring President, Hon. Wm. H. Van Epps, and his immediate predecessor, Hon. Lewis Ellsworth, with whom we have intimately associated in official connection for the past six years, we hereby tender them our sincere thanks, and assure them of our warm personal regard.

Resolved, That a Committee of one be appointed, whose duty it shall be to have prepared and presented to each of those gentlemen a suitable testimonial, appropriately inscribed, expressive of our appreciation of their valuable official services, and their private worth.

Vice President Mattson was appointed that Committee.

On motion, adjourned until 9, A. M., to-morrow.

January 7, 1865—9, *A. M.*

Pursuant to adjournment, the Committee met.

Present, as before, except Mr. McConnell.

The discussion of the question, whether there should be a law restraining persons from permitting stock to run at large, was resumed.

Mr. Rosenstiel advocated, strongly, the passage of such a law, giving a glowing description of the rural districts in Germany, where stock is restrained from running at large, and, as a consequence, the farmers and even the villagers adorn the highways by planting along them, at short intervals, the choicest fruit and ornamental trees—the fruit and shade free to the use of passers-by. He further stated that in the vicinity of towns and cities, in this State, the amount of damages sustained by the farmers, in consequence of the stock of irresponsible persons running at large, has been enormous, and seems to be a growing evil.

Instances were cited by President Van Epps, and others, where parties, residing inside the corporate limits of some of our county towns, who do not own a square foot of land, and whose dwellings are on public grounds so that they do not even pay rent, neverthe-

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Ex-President Brown gave it as his opinion, after many years' careful consideration of the subject, and, looking at it as a farmer, whose main and special business is and has been, and will continue to be, stock-raising, that it would be far better for himself and all other stock-dealers and stock-growers, if farmers and others were compelled, by law, to fence in their stock instead of their crops; and, for one, he would joyfully hail the day when the Illinois farmer who could barely get together means enough to pay for an eighty or forty acre lot, should be permitted to enter upon it and till and enjoy its fruits, without being compelled to expend an amount equal to the purchase money, in fencing it, to prevent the trespassing of stock owned by his neighbors. He was fully satisfied that such a law would add immensely to the wealth of the State, both by the increased production it would stimulate, and by the enhanced value of the fenced, as well as the vast tracts of unfenced lands. The capital necessary to commence farming would be diminished in many localities one-half; immigration would pour into our borders, manufactures would spring up, and, while all other classes would be largely benefited, even those who dealt in stock and whose farms are already fenced, would equally share in the general consequent prosperity.

The discussion of this subject was continued throughout the day and evening; and the Board, having concluded their labors, at 9, P. M., adjourned, *sine die.*

WM. H. VAN EPPS, *President.*

JOHN P. REYNOLDS, *Recording Secretary, pro tem.*

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OFFICIAL LIST OF AWARDS

AT THE ILLINOIS STATE FAIR OF 1861.

CLASS A—CATTLE.

LOT NO. 1—SHORT HORN BULLS.

BULLS FOUR YEARS OLD OR OVER—12 ENTRIES.

First Premium, $50—"Lexington"—James N. Brown, Berlin, Sangamon county, Illinois.
Second Premium, $25—"Daniel Webster"—Wm. R. Combs, Mahomet, Champaign county, Illinois.

BULLS OVER THREE AND UNDER FOUR YEARS—8 ENTRIES.

First Premium, $50—"Grampian"—James M. Hill, Jersey Prairie, Cass county, Illinois.
Second Premium, $25—"Perfection"—Jesse Cloyd, Champaign county Illinois.

BULLS OVER TWO AND UNDER THREE YEARS—9 ENTRIES.

First Premium, $40—"Emperor"—J. H. Spears, Petersburg, Menard county, Illinois.
Second Premium, $20—"Kirk"—H. and W. Sisson, Galesburg, Knox county, Illinois.

BULLS OVER ONE AND UNDER TWO YEARS—7 ENTRIES.

First Premium, $40—"Matchem"—James N. Brown, Berlin, Sangamon county, Illinois.
Second Premium, $20—"Duke of Menard"—J. H. Spears, Petersburg, Menard county, Illinois.

BULL CALVES UNDER ONE YEAR—9 ENTRIES.

First Premium, $40—"President"—J. N. Brown, Sangamon county, Illinois.
Second Premium, $20—"Alfred II"—John C. Bone, Pleasant Plains, Sangamon county, Illinois.

Awarding Committee.—Thompson Chandler, Macomb, Illinois, Chairman; Wm. C. Richards, Momence, Illinois; Robert Halloway, Monmouth, Illinois; J. B. Hunter, Greenville, Illinois, and Joseph Spettigue, London, Canada West.

SHORT HORN COWS.

COWS FOUR YEARS OLD AND OVER—15 ENTRIES.

First Premium, $50—"Lady Harriet"—J. H. Spears, Menard county, Illinois.
Second Premium, $25—"Mollie Cotton"—James Mitchell, Galesburg, Knox county, Illinois.

COWS THREE YEARS OLD AND UNDER FOUR—7 ENTRIES.

First Premium, $50—"Strawberry"—John C. Bone, Sangamon county, Illinois.
Second Premium, $25—"Fashion"—E. L. Gilham, Exeter, Scott county, Illinois.

HEIFERS OVER TWO YEARS OLD AND UNDER THREE—11 ENTRIES.

First Premium, $40—"Mary Bell"—William P. Withers, Bloomington, McLean county, Illinois.
Second Premium, $20—"Lady Admiral"—James M. Hill, Cass county, Illinois.

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HEIFERS OVER ONE AND UNDER TWO YEARS OLD—11 ENTRIES.

First Premium, $40—"Fair Maid of Springfield"—James N. Brown, Sangamon county, Illinois.
Second Premium, $20—"Blanche"—J. H. Spears, Menard county, Illinois.

HEIFER CALVES UNDER ONE YEAR OLD—10 ENTRIES.

First Premium, $40—"May Dacre"—James N. Brown, Sanagamon county, Illinois.
Second Premium, $20—"Delia"—James N. Brown, Sangamon county, Illinois.

Awarding Committee.—Robert Halloway, Chairman, Monmouth, Illinois; E. Wadsworth, Kendallville, Indiana; Thompson Chandler, Macomb, Illinois; Benjamin R. Frohock, Mt. Carroll, Illinois; B. G. Smith, Central City, Illinois.

LOT NO. 2.—DEVON CATTLE.

BULLS FOUR YEARS OLD AND OVER—9 ENTRIES.

First Premium, $50—"Curly"—A. Gordon, Heyworth, McLean county, Illinois.
Second Premium, $25—"Frank"—L. G. Collins, Linden, Montgomery county, Illinois.

BULLS THREE YEARS OLD AND UNDER FOUR—1 ENTRY.

First Premium, $50—"———"—Frank Kimball, Iowa City, Iowa.

BULLS TWO YEARS OLD AND UNDER THREE—2 ENTRIES.

No award.

BULLS ONE YEAR OLD AND UNDER TWO—6 ENTRIES.

First Premium, $40—"Young Shakspeare"—John Allen, Coldwater, Michigan.
Second Premium, $20—"Printer"—L. G. Collins, Linden, Montgomery county, Illinois.

BULL CALVES UNDER ONE YEAR OLD—14 ENTRIES.

First Premium, $40—"Star of the West"—C. D. Bent, Iowa City, Iowa.
Second Premium, $20—"Milwaukee Chief"—C. D. Bent, Iowa City, Iowa.

COWS FOUR YEARS OLD AND OVER—17 ENTRIES.

First Premium, $50—"Lilly"—John Allen, Coldwater, Michigan.
Second Premium, $25—"July Flower II"—C. D. Bent, Iowa City, Iowa.

COWS THREE YEARS OLD AND UNDER FOUR—7 ENTRIES.

First Premium, $50—"Belle of the West"—C. D. Bent, Iowa City, Iowa.
Second Premium, $25—"Adeline"—L. G. Collins, Montgomery county, Illinois.

HEIFERS OVER TWO AND UNDER THREE YEARS OLD—3 ENTRIES.

No award.

HEIFERS ONE YEAR OLD AND UNDER TWO—9 ENTRIES.

First Premium, $40—"Westerr Beauty"—Frank Kimball, Iowa City, Iowa.
Second Premium, $20—"Flora III"—C. D. Bent, Iowa City, Iowa.

HEIFER CALVES UNDER ONE YEAR OLD—12 ENTRIES.

First Premium, $40—"Flora IV"—C. D. Bent, Iowa City, Iowa.
Second Premium, $20—"Prize"—C. D. Bent, Iowa City, Iowa.

[NOTE.—It is due to Mr. Wm. H. Lock, of London, Canada West, to say that his fine herd of Devons, many of which were entered in this Lot (No. 2,) were ruled out and excluded from consideration in making the awards, only because of the rule of the Society requiring pedigrees of Devons to be presented to the committee, and Mr. Lock's failure to comply with that rule.]

Awarding Committee.—Wm. Duane Wilson, Chairman, DesMoines, Iowa; William Sisson, Henderson, Knox county, Illinois; Alva Dunlap, Peoria, Illinois; J. W. Hoyt, Madison, Wisconsin; K. K. Jones, Quincy, Illinois.

LOT NO 3.—HEREFORDS, OWNED IN ILLINOIS.

No entries. Thomas Aston, of Elyria, Ohio, presented for exhibition a herd of Herefords, which the Awarding Committee, after examination, pronounced worthy a premium.

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LOT NO. 4—AYRESHIRES OWNED IN ILLINOIS.

No entries.

LOT NO. 5—ALDERNEYS OWNED IN ILLINOIS.

BULLS THREE YEARS OLD OR OVER—1 ENTRY.

No award.

COWS THREE YEARS OLD OR OVER—2 ENTRIES.

First Premium, $25—"Grisette"—B. F. Carver, Chicago, Illinois.

LOT NO. 6—MILCH COWS.

No entries.

LOT NO. 7—NATIVES AND CROSSES.

COWS FOUR YEARS OLD OR OVER—15 ENTRIES.

First Premium, $40—"Lady Seaham"—James M. Hill, Jersey Prairie, Cass county, Illinois.
Second Premium, $20—"Lilly"—Wm. Lurton, Jacksonville, Illinois.

COWS THREE YEARS OLD AND UNDER FOUR—3 ENTRIES.

First Premium, $30—"Rose"—John C. Bone, Pleasant Plains, Illinois.

COWS TWO YEARS OLD AND UNDER THREE—10 ENTRIES.

First Premium, $30—"Rose"—Washington Iles, Springfield, Illinois.
Second Premium, $15—"Rose Belle"—Wm. P. Withers, Bloomington, Illinois.

HEIFERS ONE YEAR OLD AND UNDER TWO—9 ENTRIES.

First Premium, $20—"Lady Ellsworth"—E. B. Hitt, Exeter, Scott county, Illinois.
Second Premium, $10—"Lilla"—Washington Iles, Springfield, Illinois.

HEIFER CALVES UNDER ONE YEAR OLD—6 ENTRIES.

First Premium, $20—"Lady Anderson"—E. B. Hitt, Exeter, Scott county, Illinois.
Second Premium, $10—"Miss Belmont"—John C. Bone, Pleasant Plains, Illinois.

Awarding Committee.—Amos Ward, Chairman, Altona, Knox county, Illinois; Benj. Frohock, Mt. Carroll, Carroll county, Illinois; A. V. Brooking, Macomb, McDonough county, Illinois; L. E. Gordon, Heyworth, McLean county, Illinois; E. Wadsworth, Kendalville, Indiana.

LOT NO. 8—FAT CATTLE.

BULLOCKS FOUR YEARS OLD AND OVER—13 ENTRIES.

Premium, $20—"Allen"—J. H. Spears, Petersburg, Illinois.

COWS FOUR YEARS OLD AND OVER—3 ENTRIES.

Premium, $10—"Polly"—John L. Hancock, Chicago, Illinois.

LOT NO. 9—WORK OXEN AND STEERS.

No entries.

LOT NO. 10—SWEEPSTAKES.

BULL AND FIVE COWS ONE YEAR OLD AND UPWARDS FROM ONE COUNTY—8 ENTRIES.

First Premium, $50—James N. Brown, Sangamon county, Illinois.
Second Premium, $25—James M. Hill, Cass county, Illinois.

FIVE HEAD OF CALVES UNDER ONE YEAR OLD FROM ONE COUNTY—6 ENTRIES.

First Premium, $30—James N. Brown, Sangamon county, Illinois.
Second Premium, $15—John C. Bone, Pleasant Plains, Illinois.

COW OR HEIFER OF ANY AGE—5 ENTRIES.

Premium, Gold Medal—"Emerald"—J. C. Bone, Pleasant Plains, Illinois.

BULL OF ANY AGE—24 ENTRIES.

Premium, Gold Medal—"King Alfred"—James N. Brown, Sangamon county, Illinois.

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HERD OF NOT LESS THAN FIVE ANIMALS DROPPED AND REARED IN THIS STATE AND OWNED BY ONE INDIVIDUAL—7 ENTRIES.

First Premium, $50—James Mitchell, Galesburg, Illinois.
Second Premium, $25—J. C. Bone, Pleasant Plains, Illinois.

Awarding Committee.—O. S. Hough, Chicago, Illinois; B. S. West, Oneida, Knox county, Illinois; John S. Brown, DeKalb county, Illinois; E. S. Lovell, Kalamazoo, Michigan; C. D. Bent, Iowa City, Iowa.

CLASS B—HORSES.

LOT NO. 11—THOROUGHBRED HORSES.

STALLIONS FOUR YEARS OLD AND OVER—9 ENTRIES.

First Premium, $40—"Princeton"—Simon Ruble, Beloit, Wisconsin.
Second Premium, $25—"Capt. Buford"—H. H. Yates, Chicago, Illinois.

STALLIONS OVER THREE YEARS OLD AND UNDER FOUR—2 ENTRIES.

First Premium, $30—"Capt. Allen"—Wm. W. Morton, Jacksonville, Illinois.
Second Premium, $20—"Young Garibaldi"—Henry Lash, Bloomington, Illinois.

STALLIONS OVER TWO YEARS OLD AND UNDER THREE—3 ENTRIES.

First Premium, $30—"Priam"—P. Warren, Springfield, Illinois.
Second Premium, $15—"Buckhart"—Wm. W. Morton, Jacksonville, Illinois.

BROOD MARE FOUR YEARS OLD AND OVER—6 ENTRIES.

First Premium, $40—"Corenna"—F. M. Morton, Jacksonville, Illinois.
Second Premium, $25—"Mary Gray"—Henry Lash, Bloomington, Illinois.

FILLY OVER TWO YEARS AND UNDER THREE—2 ENTRIES.

First Premium, $30—"Kate Robb"—Joseph Morton, Jacksonville, Illinois.
Second Premium, $15—"Minnehaha"—J. V. Robbins, Madison, Wisconsin.

FILLY OVER ONE AND UNDER TWO YEARS OLD—1 ENTRY.

First Premium, $30—"Beck"—J. V. Robbins, Madison, Wisconsin.

SUCKING MARE COLT—1 ENTRY.

First Premium, $20—"Cinderella"—A. G. Carl, Urbana, Illinois.

Awarding Committee.—S. B. Davis, Milwaukee, Wisconsin; Joseph Spettigue, London, Canada; Thomas S. Adams, Brown county; James M. Hill, Cass county; E. L. Roberts, Morgan county, Illinois.

LOT NO. 12—ROADSTERS.

STALLIONS FOUR YEARS OLD AND OVER—32 ENTRIES.

First Premium, $40—"Black Hawk Prophet"—D. J. Wetherbee, Sterling, Whiteside county, Illinois.
Second Premium, $25—"Draco"—J. W. Holcomb, Ticonderoga, Essex county, N. Y.

STALLION OVER THREE YEARS AND UNDER FOUR—9 ENTRIES.

First Premium, $30—"Sucker Chief"—J. D. & C. W. Landers, Bloomington, Illinois.
Second Premium, $20—"Joseph the Yankee Hero"—George N. Farmer, Santa Anna, Illinois.

STALLION OVER TWO YEARS OLD AND UNDER THREE—12 ENTRIES.

First Premium, $20—"Robert Bonner"—C. T. P. Buck, Aurora, Illinois.
Second Premium, $10—"Young Comet"—M. Hynds, Morris, Grundy county, Illinois.

STALLIONS OVER ONE YEAR AND UNDER TWO—6 ENTRIES.

First Premium, $20—"General Fremont"—J. C. Oliver, Palmyra, Lee county, Illinois.
Second Premium, $10—"Victor"—M. Stone, Quincy, Illinois.

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STALLION COLT UNDER ONE YEAR OLD—9 ENTRIES.

First Premium, $20—"Star"—M. Stone, Quincy, Illinois.
Second Premium, $10—"Morgan Rattler"—E. W. Jones, Wilmington, Illinois.

MARES FOUR YEARS OLD AND OVER—21 ENTRIES.

First Premium, $40—"Pocahontas"—T. S. Goly, Pecatonica, Illinois.
Second Premium, $25—"Kitty Mohawk"—Thomas Smith, Springfield, Illinois.

MARES TWO YEARS OLD AND UNDER THREE—2 ENTRIES.

First Premium, $20—"Jenny Lind"—G. Bates, Tuscola, Douglas county, Illinois.
Second Premium, $10—"Lill"—A. B. Brooks, Lockport, Illinois.

FILLY OVER ONE YEAR OLD AND UNDER TWO—5 ENTRIES.

First Premium, $20—"Flora"—J. M. Graham, Champaign, Illinois.
Second Premium, $10—"Belle of Rockford"—Calvin Rowley, Rockford, Illinois.

MARE COLT UNDER ONE YEAR OLD—4 ENTRIES.

First Premium, $20—"Jane"—F. M. Morton, Jacksonville, Illinois.
Second Premium, $10—"Filly"—Alfred Guthrie, Chicago, Illinois.

Awarding Committee.—G. W. Gage, Chairman, Chicago, Illinois; John Wentworth, Chicago, Illinois; J. B. Perkins, Springfield, Illinois; J. V. Robbins, Madison, Wisconsin; T. S. Adams, Mt. Sterling, Brown county, Illinois; F. P. Snyder, Mt. Sterling, Brown county, Illinois; Jason Gurley, Chicago, Illinois; James M. Hill, Cass county, Illinois; Wm. M. Derby, Chicago, Illinois.

LOT NO. 13—HORSES OF ALL WORK.

STALLIONS FOUR YEARS OLD AND OVER—22 ENTRIES.

First Premium, $40—"John Bull, Jr."—J. K. Litts, Chelsea, Will county, Illinois.
Second Premium, $25—"Morgan Dick"—Henty Bagg, Wauconda, Illinois.

STALLIONS OVER THREE AND UNDER FOUR YEARS OLD—4 ENTRIES.

First Premium, $30—"Benicia Boy"—A. B. Brooks, Lockport, Illinois.
Second Premium, $20—"Black Hawk Stallion"—John E. Waite, Sycamore, DeKalb county, Illinois.

STALLIONS OVER TWO AND UNDER THREE YEARS OLD—9 ENTRIES.

First Premium, $30—"Young Prophet"—O. L. R. White, Palmyra, Lee county, Illinois.
Second Premium, $15—"Morgan Chief"—A. B. Brooks, Lockport, Illinois.

STALLION COLT OVER ONE YEAR OLD AND UNDER TWO—7 ENTRIES.

First Premium, $30—"Kentucky Boy"—J. Rickard, South Grove, DeKalb county, Illinois.
Second Premium, $15—"Champion"—M. Stone, Quincy, Illinois.

BROOD MARE OVER FOUR YEARS OLD—26 ENTRIES.

First Premium, $40— —M. Stone, Quincy, Illinois.
Second Premium, $25—"Jenny Lind"—F. M. Morton, Jacksonville, Illinois.

BROOD MARE OVER THREE YEARS OLD AND UNDER FOUR—4 ENTRIES.

First Premium, $30—"Lida Ewing"—F. M. Morton, Jacksonville, Illinois.
Second Premium, $20—"Doll"—William S. Skinner, Lake Zurich, Lake county, Illinois.

FILLY OVER TWO AND UNDER THREE YEARS OLD—3 ENTRIES.

First Premium, $30—"Jenny Lind"—G. Bates, Arcola, Douglas county, Illinois.
Second Premium, $20—"Sally"—John Frazer, Chicago, Illinois.

FILLY OVER ONE YEAR OLD AND UNDER TWO—4 ENTRIES.

First Premium, $30—"Sophia"—Wm. R. Combs, Mahomet, Champaign county, Illinois.
Second Premium, $15—"Nancy"—Luther Turner, jr., Lake Zurich, Lake county, Illinois.

SUCKING COLT (MARE OR HORSE)—19 ENTRIES.

First Premium, $20—"Red Bird"—F. M. Morton, Jacksonville, Illinois.
Second Premium, $10—"Fanny"—A. Kershaw, Wayne, Du Page county, Illinois.

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Awarding Committee—Jason Gurley, Chicago, Illinois; E. Simms, Adams county, Illinois; James M. Hill, Cass county, Illinois.

LOT NO. 14—DRAUGHT HORSES.

STALLIONS FOUR YEARS OLD AND OVER—10 ENTRIES.

First Premium, $40—"Young Canada"—James Addison, Richview, York county, C. W.
Second Premium, $25—"Roland"—Lewis Russ, Onarga, Iroquois county, Illinois.

STALLIONS THREE YEARS OLD AND UNDER FOUR—3 ENTRIES.

First Premium, $20—"Louis" —A. G. Carle, Urbana, Illinois.
Second Premium, $10—"Highlander"—Wm. Graham, Chicago, Illinois.

STALLIONS TWO YEARS OLD AND UNDER THREE—3 ENTRIES.

First Premium, $20—"Morgan Lion"—Sam. Hose, Oregon, Ogle county, Illinois.
Second Premium, $10—"Prophet 2d"—Wm. Rink, Dixon, Lee county, Illinois.

GELDING FOR DRAUGHT—5 ENTRIES.

Premium, $20—"Doc"—Henry Lash, Bloomington.

Awarding Committee.—Wm. Derby, Chicago, Illinois; James M. Hill, Cass county; B. F. Hitt, Exeter, Scott county; A. G. Carle, Urbana, Champaign county; B. C. Paine, DeKalb county, Illinois.

LOT NO. 18—JACKS, JENNETS AND MULES.

JACKS OVER FOUR YEARS OLD—2 ENTRIES.

First Premium, $40—"Buena Vista"—Henry Tanner, Taylorville, Christian county, Illinois.
Second Premium, $25—"General Walker"—Washington Iles, Springfield, Illinois.

JACKS THREE YEARS OLD AND UNDER FOUR—5 ENTRIES.

First Premium, $30—"Sam"—B. F. Hitt, Exeter, Scott, county, Illinois.
Second Premium, $15—"Bourbon Star"—David Root, Batavia, Illinois.

JACK ONE YEAR OLD AND UNDER TWO—1 ENTRY.

First Premium, $20—"——"—Calvin Rowley, Rockford, Illinois.

JACK SUCKING COLT—1 ENTRY.

First Premium, $10—"——"—A. H. Hawley, McHenry county, Illinois.

JENNET FOUR YEARS OLD OR OVER—5 ENTRIES.

First Premium, $30—"Topsy"—T. A. Miller, Barrington Station, Cook county, Illinois.
Second Premium, $15—"Polly"—J. W. Seymour, Barrington, Cook county, Illinois.

JENNET SUCKING COLT—1 ENTRY.

First Premium, $10—"Dinah"—J. W. Seymour, Barrington, Cook county, Illinois.

PAIR MULES FOR DRAUGHT OR FARM—6 ENTRIES.

First Premium, $20—"Nellie" and "Dollie"—J. M. Graham, Champaign, Illinois.
Second Premium, $10—"Pollie" and "Mollie"—Kidder & Knox, Evanston, Cook county, Illinois.

MULES OVER ONE AND UNDER TWO YEARS OLD—8 ENTRIES.

First Premium, $10—"Susan"—Wm. Y. McCord, Santa Anna, De Witt county, Illinois.
Second Premium, $5—"Vic"—B. F. Hitt, Scott county, Illinois.

Awarding Committee.—Thomas S. Adams, Chairman, Mt. Sterling, Illinois; Wm. M. Derby, Chicago, Illinois; B. G. Roots, Tamaroa, Illinois; A. J. Dunlap, Henderson, Illinois.

CLASS C—SHEEP.

LOT NO. 19—MUTTON SHEEP—LONG-WOOLED.

BUCKS OVER TWO YEARS OLD—9 ENTRIES.

First Premium, $20—P. G. Bauder, New Milford, Illinois.
Second Premium, $10—Thomas Ashton, Elyria, Ohio.

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BUCKS OVER ONE AND UNDER TWO YEARS OLD—6 ENTRIES.

First Premium, $20—P. G. Bauder, New Milford, Illinois.
Second Premium, $10—Sam. Toms, Elyria, Ohio.

BUCK LAMBS UNDER ONE YEAR OLD—6 ENTRIES.

First Premium, $20—Thomas Ashton, Elyria, Ohio.
Second Premium, $10—P. G. Bauder, New Milford, Illinois.

PEN OF THREE EWES OVER TWO YEARS OLD—6 ENTRIES.

First Premium, $20—Thomas Ashton, Elyria, Ohio.
Second Premium, $10—P. G. Bauder, New Milford, Illinois.

PEN OF THREE EWES UNDER TWO YEARS OLD—4 ENTRIES.

First Premium, $20—P. G. Bauder, New Milford.
Second Premium, $10—A. W. Arnold, Kilbuck, Illinois.

PEN OF THREE EWE LAMBS UNDER ONE YEAR OLD—5 ENTRIES.

First Premium, $20—J. D. G. Nelson, Fort Wayne, Indiana.
Second Premium, $10—Sam. Toms, Elyria, Ohio.

LOT NO. 20—MIDDLE-WOOLED, SOUTHDOWN, ETC.

BUCKS OVER TWO YEARS OLD—9 ENTRIES.

First Premium, $20—G. W. Becraft, Jacksonville.
Second Premium, $10—Sam. Toms, Elyria, Ohio.

BUCKS UNDER TWO YEARS OLD—11 ENTRIES.

First Premium, $20—S. C. Rankin, Fairmount, Illinois.
No Second Premium awarded.

BUCK LAMBS UNDER ONE YEAR OLD—7 ENTRIES.

First Premium, $20—James N. Brown, Berlin, Sangamon county, Illinois.
Second Premium, $10—Sam. Toms, Elyria, Ohio.

PEN OF THREE EWES OVER TWO YEARS OLD—5 ENTRIES.

First Premium, $20—James N. Brown, Berlin, Illinois.
Second Premium, $10—Sam. Toms, Elyria, Ohio.

PEN OF THREE EWES OVER ONE AND UNDER TWO YEARS OLD.

First Premium, $20—James N. Brown, Berlin, Illinois.
Second Premium, $10—G. W. Becraft, Jacksonville.

PEN OF THREE EWE LAMBS UNDER ONE YEAR OLD.

First Premium, $20—G. W. Becraft, Jacksonville.
Second Premium, $10—Sam. Toms, Elyria, Ohio.

LOT NO. 24—FAT SHEEP.

THREE FAT SHEEP OVER TWO YEARS OLD.

Premium, $15—James N. Brown, Berlin, Illinois.

THREE FAT SHEEP UNDER TWO YEARS OLD.

Premium, $15—G. W. Becraft, Jacksonville.

The premium fat sheep in both the foregoing lots were crosses of Southdown and Native.

Awarding Committee for Lots 19, 20 *and* 24.—Charles W. Murtfeldt, Chairman, Ogle county, Illinois; S. M. Parsons, Sangamon county, Illinois; Charles H. Rosenstiel, Stephenson county, Illinois.

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LOT NO. 21—FRENCH MERINOES.

BUCKS OVER TWO YEARS OLD—6 ENTRIES.

First Premium, $20—E. Humphrey, Lyons, Wisconsin.
Second Premium, $10—A. B. McConnell, Springfield.

BUCKS UNDER TWO YEARS OLD—4 ENTRIES.

First Premium, $20—John McConnell, Springfield.
Second Premium, $10—A. B. McConnell, Springfield.

BUCK LAMBS UNDER ONE YEAR OLD.

First Premium, $20—John McConnell, Springfield.
Second Premium, $10—A. B. McConnell, Springfield.

PEN OF THREE EWES OVER TWO YEARS OLD—6 ENTRIES.

First Premium, $20—John McConnell, Springfield.
Second Premium, $10—A. B. McConnell, Springfield.

PEN OF THREE EWES UNDER TWO YEARS OLD—4 ENTRIES.

First Premium, $20—A. B. McConnell, Springfield.
Second Premium, $10—John McConnell, Springfield.

PEN OF THREE EWE LAMBS UNDER ONE YEAR OLD—4 ENTRIES.

First Premium, $20—C. H. Rosenstiel, Freeport, Illinois.
Second Premium, $10—A. B. McConnell, Springfield.

Awarding Committee, Lot 21.—William B. Green, Chairman, Naperville, Illinois; D. C. Reed, Kalamazoo, Michigan; Miron Spencer, Joliet, Illinois.

LOT NO. 22—SPANISH MERINOES.

BUCKS OVER TWO YEARS OLD—8 ENTRIES.

First Premium, $20—P. Spencer, Danville, Illinois.
Second Premium, $10—A. B. McConnell, Springfield.

BUCKS UNDER TWO YEARS OLD—12 ENTRIES.

First Premium, $20—Gorham & Gillett, Hadley, Illinois.
Second Premium, $10—Kelly & Barnes, Wheaton, Illinois.

BUCK LAMBS UNDER ONE YEAR OLD—11 ENTRIES.

First Premium, $20—A. B. McConnell, Springfield.
Second Premium, $10—Kelly & Barnes, Wheaton, Illinois.

PEN OF THREE EWES OVER TWO YEARS OLD—8 ENTRIES.

First Premium, $20—A. B. McConnell, Springfield.
Second Premium, $10—Kelly & Barnes, Wheaton, Illinois.

PEN OF THREE EWES UNDER TWO YEARS OLD—10 ENTRIES.

First Premium, $20—Kelly & Barnes, Wheaton, Illinois.
Second Premium, $10—P. Spencer, Danville, Illinois.

PEN OF THREE EWE LAMBS UNDER ONE YEAR OLD—8 ENTRIES.

First Premium, $20—John McConnell, Springfield.
Second Premium, $10—Kelly & Barnes, Wheaton, Illinois.

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BUCKS UNDER TWO YEARS OLD—13 ENTRIES.

First Premium, $20—John McConnell, Springfield, Illinois.
Second Premium, $10—A. B. McConnell, Springfield, Illinois.

BUCK LAMB UNDER ONE YEAR OLD—18 ENTRIES.

First Premium, $20—C. H. Rosenstiel, Freeport, Illinois.
Second Premium, $10—P. Burnham, Wheaton, Illinois.

PEN OF THREE EWES OVER TWO YEARS OLD—10 ENTRIES.

First Premium, $20—P. Spencer, Danville, Illinois.
Second Premium, $10—C. H. Rosenstiel, Freeport, Illinois.

PEN OF THREE EWES UNDER TWO YEARS OLD—8 ENTRIES.

First Premium, $20—P. Spencer, Danville, Illinois.
Second Premium, $10—A. B. McConnell, Springfield, Illinois.

PEN OF THREE EWE LAMBS UNDER ONE YEAR OLD—12 ENTRIES.

First Premium, $20—C. H. Rosenstiel, Freeport, Illinois.
Second Premium, $10—John McConnell, Springfield, Illinois.

LOT NO. 27—SWEEPSTAKES FOR ALL MUTTON BREEDS.

ONE BUCK AND NINE EWES OF ANY AGE—8 ENTRIES.

First Premium, $20—Thomas Ashton, Elyria, Ohio.
Second Premium, $10—P. G. Bauder, New Milford, Illinois.

LOT NO. 25—SWEEPSTAKES FOR FRENCH MERINOES.

ONE BUCK AND NINE EWES OF ANY AGE—3 ENTRIES.

First Premium, $20—John McConnell, Springfield, Illinois.
Second Premium, $10—A. B. McConnell, Springfield, Illinois.

LOT NO. 26—SWEEPSTAKES FOR SPANISH MERINOES.

ONE BUCK AND NINE EWES OF ANY AGE—5 ENTRIES.

First Premium, $20—P. Spencer, Danville, Illinois.
Second Premium, $10—C. H. Smith, Ney, Illinois.

Awarding Committee for Lots 23, 25, 26 *and* 27.—Charles D. Haight, Naperville, Illinois, W. P. Benson, Fort Atkinson, Wisconsin; L. G. Collins, Montgomery county, Indiana.

CLASS D—SWINE.

LOT NO. 28—BERKSHIRES.

BOARS OVER TWO YEARS OLD—2 ENTRIES.

First Premium, $20—John C. Crowder, Springfield, Illinois.
Second Premium, $10—Jesse Cloyd, Champaign, Illinois.

BOARS OVER ONE AND UNDER TWO YEARS OLD—3 ENTRIES.

First Premium, $20—J. M. Graham, Champaign, Illinois.
Second Premium, $10—John C. Crowder, Springfield, Illinois.

BOARS UNDER ONE YEAR OLD—7 ENTRIES.

First Premium, $10—Jesse Cloyd, Champaign, Illinois.
Second Premium, $5— " " " "

SOWS OVER TWO YEARS OLD—4 ENTRIES.

First Premium, $20—John C. Crowder, Springfield, Illinois.
Second Premium, $10—J. M. Graham, Champaign, Illinois.

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SOWS OVER ONE AND UNDER TWO YEARS OLD—3 ENTRIES.

First Premium, $20—John C. Crowder, Springfield, Illinois.
Second Premium, $10—Jesse Cloyd, Champaign, Illinois.

SOWS UNDER ONE YEAR OLD—7 ENTRIES.

First Premium, $10—J. M. Graham, Champaign, Illinois.
Second Premium, $5—Jesse Cloyd, Champaign, Illinois.

LOT NO. 30—SUFFOLK, CHINA, ESSEX AND OTHER SMALL BREEDS.

BOARS OVER TWO YEARS OLD—6 ENTRIES.

First Premium, $20—J. J. Cleveland, Naperville, Illinois.
Second Premium, John Wentworth, Chicago, Illinois.

BOARS OVER ONE AND UNDER TWO YEARS OLD—5 ENTRIES.

First Premium, $20—R. S. Palmer, Naperville, Illinois.
Second Premium, $10—J. M. Gillett, Hadley, Illinois.

BOARS UNDER ONE YEAR OLD—11 ENTRIES.

First Premium, $20—J. V. Robbins, Madison, Wisconsin.
Second Premium, $5—Austin Richards, Downer's Grove, Illinois.

SOWS OVER TWO YEARS OLD—4 ENTRIES.

First Premium, $20—Horace Miller, Rockford, Illinois.
Second Premium, $10—John Wentworth, Chicago, Illinois.

SOWS OVER ONE YEAR OLD AND UNDER TWO YEARS OLD—6 ENTRIES.

First Premium, $20—Austin Richards, Downer's Grove, Illinois.
Second Premium, $10—Frank Kimball, Iowa City, Iowa.

SOWS UNDER ONE YEAR OLD—8 ENTRIES.

First Premium, $10—Horace Miller, Rockford, Illinois.
Second Premium, $5—John Wentworth, Chicago, Illinois.

SOWS WITH LITTERS OF PIGS UNDER FOUR MONTHS OLD—4 ENTRIES.

First Premium, $20—E. E. Gorham, Hadley, Will county, Illinois.
Second Premium, $10—Horace Miller, Rockford, Illinois.

Awarding Committee for Lots 28 *and* 30.—A. J. Warner, Chairman, Prophetstown, Illinois; C. C. Blisch, Kewanee, Illinois; O. Barnard, Bloomington, Illinois.

LOT NO. 29—CUMBERLAND, YORKSHIRE, CHESTER WHITE, WOBURN, IRISH AND MAGIE BREEDS.

BOARS OVER TWO YEARS OLD—5 ENTRIES.

First Premium, $20—S. I. Morey, Adams county, Illinois.
Second Premium, $10—J. V. Robbins, Madison, Wisconsin.

BOARS OVER ONE AND UNDER TWO YEARS OLD—5 ENTRIES.

First Premium, $20—Edward Waterhouse, Milwaukee, Wisconsin.
Second Premium, $10—J. H. Benson, Cardington, Ohio.

BOARS UNDER ONE YEAR OLD—11 ENTRIES.

First Premium, $10—J. B. Phinney, Champaign, Illinois.
Second Premium, $5—A. Moss, Belvidere, Illinois.

SOWS OVER TWO YEARS OLD—2 ENTRIES.

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SOWS UNDER ONE YEAR OLD—8 ENTRIES.

First Premium, $10—J. R. Phinney, Champaign, Illinois.
Second Premium, $5—A. Moss, Belvidere, Illinois.

SOWS WITH LITTERS OF PIGS UNDER FOUR MONTHS OLD—4 ENTRIES.

First Premium, $20—J. V. Robbins, Madison, Wisconsin.
Second Premium, $10— " " " "

LOT NO. 31—CROSSES.

BOARS UNDER ONE YEAR OLD—11 ENTRIES.

First Premium, $10—S. I. Morey, Clayton, Illinois.
Second Premium, $5—James M. Hill, Jersey Prairie, Illinois.

SOWS OVER ONE AND UNDER TWO YEARS OLD—8 ENTRIES.

First Premium, $20—Jesse Cloyd, Champaign, Illinois.
Second Premium, $10—David Callahan, Springfield, Illinois.

SOWS UNDER ONE YEAR OLD—8 ENTRIES.

First Premium, $10—S. I. Morey, Adams county, Illinois.
Second Premium, $5—R. S. Palmer, Naperville, Illinois.

SOWS WITH LITTERS OF PIGS UNDER FOUR MONTHS OLD—2 ENTRIES.

First Premium, $20—Charles Snoad, Joliet, Illinois.
Second Premium, $10—Jesse Cloyd, Champaign, Illinois.

Awarding Committee for Lots 29 and 31.—W. P. Sisson, Chairman, Galesburg, Illinois; R. Marriatt, Urbana, Illinois; Luther Martin, Galesburg, Illinois.

LOT NO. 32—SWEEPSTAKES FOR ALL BREEDS AND CROSSES.

BOAR AND THREE SOWS—12 ENTRIES, REPRESENTING SUFFOLK, CHESTER WHITES, LEICESTERS AND BERKSHIRES.

First Premium, $20—Berkshires—belonging to John C. Crowder, Springfield, Illinois.
Second Premium, $15—Suffolks—belonging to Horace Miller, Rockford, Illinois.

BOAR OF ANY AGE—25 ENTRIES.

Premium, $20—Suffolk—belonging to John Wentworth, Chicago, Illinois.

SOW OF ANY AGE—22 ENTRIES.

Premium, $20—J. B. Phinney, Champaign, Illinois.

Awarding Committee for Lot 32.—Alva Dunlap, Chairman, Peoria, Illinois; William P. West, Geneva, Illinois; Charles W. Murtfeldt, Oregon, Illinois.

CLASS E—POULTRY.

LOT NO. 33.

SHOW OF CHICKENS—NOT LESS THAN FIVE DISTINCT BREEDS.

First Premium, $10—W. G. Wells, Lockport, Illinois.
Second Premium, $5—David Callahan, Springfield, Illinois.

SHOW OF POULTRY OTHER THAN CHICKENS.

First Premium, $10—John Wentworth, Chicago, Illinois.
Second Premium, $5—David Callahan, Springfield, Illinois.

ONE PAIR CHICKENS FOR FARMERS' USE.

First Premium, $3—Bramas—by David Callahan, Springfield, Illinois.
Second Premium, $2—Black Spanish—by David Anderson, St. Charles, Illinois.

Awarding Committee for Lot 33.—P. S. Spencer, Chairman, Danville, Illinois; Horace Messenger, Lockport, Illinois; J. M. Gillett, Hadley.

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CLASS F—MECHANIC ARTS.

LOT NO. 34—PLOWS, SOWERS, CULTIVATORS, ETC.

TWO HORSE PLOW FOR GENERAL PURPOSES—2 ENTRIES.

Premium, Gold Medal—Furst & Bradley, Chicago, Illinois.

TWO HORSE PLOW FOR CLAY SOIL—2 ENTRIES.

Premium, $20—Charles H. Deere, Moline, Illinois.

TWO HORSE PLOW FOR ALLUVIAL OR PRAIRIE SOIL—3 ENTRIES.

Premium, $20—Charles H. Deere, Moline, Illinois.

TWO HORSE PLOW FOR SOD OR TURF—3 ENTRIES.

Premium, $20—Charles H. Deere, Moline, Illinois.

ONE HORSE PLOW—1 ENTRY.

Premium, $5—Charles H. Deere, Moline, Illinois,

SUBSOIL PLOW—4 ENTRIES.

Premium, $20—Charles H. Deere, Moline, Illinois.

SINGLE SHOVEL PLOW—3 ENTRIES.

Premium, $5—Charles H. Deere, Moline, Illinois.

DOUBLE SHOVEL PLOW—5 ENTRIES.

Premium, $5—Charles H. Deere, Moline, Illinois.

THREE-SHOVEL PLOWS—3 ENTRIES.

Premium, $5—Charles H. Deere, Moline, Illinois.

TRENCH PLOW—2 ENTRIES.

Premium, $20—St. Joseph Iron Company, Mishwauka, Indiana.

GANG PLOW—3 ENTRIES.

Premium, $10—Jacob Haege, Shiloh, St. Clair county, Illinois.

New and valuable implements which shall put the soil in condition to propagate a crop at less expense than by ordinary plowing; premium $100.

For this there were five entries, and the Awarding Committee, through their Chairman, report "No premium awarded, because we had no proper place or time or weather, to try either of the machines—will report at length on each." (The final report has not been received.—*Secretary.*)

CULTIVATOR—11 ENTRIES.

Premium, $5—N. & J. Carr, Monmouth, Illinois.

TWO HORSE HARROW—4 ENTRIES.

Premium, $10—William Black, Blue Island, Illinois.

REVOLVING HARROW—1 ENTRY.

By S. G. Randall, Rockford, Illinois. The Committee say, "worthy of notice."

HORSE CORN-PLANTER—4 ENTRIES.

Premium, $15—G. W. Brown, Galesburg, Illinois.

HAND CORN-PLANTER—1 ENTRY.

No award.

WHEAT DRILL—8 ENTRIES.

Premium, $20—D. J. Powers, Madison, Wisconsin—Smith, Barnes & Co., Tiffin, Ohio, Patentees and Manufacturers.

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HORSE BROADCAST SOWER—7 ENTRIES.

Premium, Silver Medal—Barnes & Boynton, Rockford, Illinois, "Barnes' Broadcast Sower."

HAND BROADCAST SOWER—1 ENTRY.

No award.

Awarding Committee for Lot 34.—Wm. Duane Wilson, Chairman, Iowa City, Iowa; Alva Dunlap, Peoria, Illinois; D. J. Powers, Madison, Wisconsin; H. Miller, J. E. Youngman, A. D. Forbes, Rockford, Illinois.

LOT NO. 35—REAPERS, MOWERS, ETC.

REAPER—8 ENTRIES.

Premium, Gold Medal—E. Ball, Canton, Ohio.

[NOTE.—In this lot was entered by J. C. & C. N. Mayberry, of Lane Station, Ogle county, Illinois, an implement of which the Committee say, "This implement, in the opinion of your Committee, should not come in competition with reapers, it being a "header" of superior qualities, with improvements, making it (as a "header") far superior to any known by your Committee, yet, ninety-nine out of every hundred would prefer the reaper."]

MOWER—8 ENTRIES.

Premium, Gold Medal—E. Ball, Canton, Ohio.

COMBINED REAPER AND MOWER—14 ENTRIES.

Premium, Gold Medal—E. Ball, Canton, Ohio.

ONE HORSE MOWER—3 ENTRIES.

Premium, $20—W. A. Talcott, Rockford, Illinois.

MOLE DITCHING MACHINE—1 ENTRY.

Premium, Silver Medal and $10—of which the Committee award only the Silver Medal, because they say the same machine has heretofore taken the highest prize of this Society, and is again presented without improvement—to James Adair, Mendota, Illinois.

IMPLEMENT FOR SHOCKING AND CUTTING CORN—1 ENTRY.

J. W. Bope & Co., Chicago, Illinois. Committee say, "This implement we commend to the consideration of the Board, though of its efficiency we cannot decide unless we see it in use."

REVOLVING HORSE RAKE—3 ENTRIES.

Premium, $10—Furst & Bradley, Chicago, Illinois.

SPRING-TOOTHED HORSE RAKE—2 ENTRIES.

Premium, $10—Furst & Bradley, Chicago, Illinois.

Awarding Committee for Lot 35.—S. M. Parsons, Chairman, Chatham, Illinois; S. D. Dole, Mattoon, Illinois; C. H. Rosenstiel, Freeport, Illinois; E. F. McConnell, Chatham, Illinois.

LOT NO. 36—THRESHING AND OTHER MACHINES, AND GARDENERS' TOOLS.

THRESHING MACHINE AND SEPARATOR—5 ENTRIES.

Premium, Gold Medal—J. R. Moffitt, Piqua, Ohio.

TWO HORSE THRESHING MACHINE—3 ENTRIES.

Premium, $25—Wilber, Emery & Co., Chicago, Illinois.

EIGHT HORSE POWER—4 ENTRIES.

Premium, $20—Bennett Brothers, New York City.

TWO HORSE POWER—6 ENTRIES.

Premium, $15—Sandford's Anti-friction Horse Power—by Bennett Brothers, New York City.

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ONE HORSE POWER—3 ENTRIES.

Premium, $10—Wilber, Emery & Co., Chicago, Illinois.

FANNING MILL—8 ENTRIES.

Premium, $5—Davis & Palmer, Hudson, Michigan.

[NOTE.—In relation to the Fanning Mill entered by Brigham, Bean & Wright, Somonauk, DeKalb county, Illinois, the Awarding Committee say, "Your Committee believe entry 91 to be the best Fanning Mill on exhibition, but it was ruled out before the award was made, on account of a misapprehension in regard to the entry."]

CORN AND COB MILL—3 ENTRIES.

Premium, $10—James A. Carpenter, Beloit, Wisconsin.

HORSE POWER CORN SHELLER—8 ENTRIES.

Premium, $20—A. M. Cook, Chicago, Illinois.

HAND CORN SHELLER—1 ENTRY.

Premium, Silver Medal—A. Adams & Co., Sandwich, Illinois.

PORTABLE HAY PRESS—1 ENTRY.

Premium, $20—Edward Little, Amboy, Illinois.

HAY PITCHING MACHINE—3 ENTRIES.

Premium, $20—Levi A. Beardsley, South Edmeston, New York.

STRAW AND HAY CUTTER—7 ENTRIES.

Premium, $10—E. E. Platt, Harrisburg, Pennsylvania.

SMUT MACHINE—2 ENTRIES.

Premium, $20—Woodward & Hemmingway, Moline, Illinois.

SPADING FORK—4 ENTRIES.

By the same parties, embracing four varieties of Forks—the Committee awarding the Premium, Silver Medal—to Sprague, Withington & Co., Jackson, Michigan.

CORN KNIFE, THREE DIFFERENT KINDS.

Premium, Silver Medal—Sprague, Withington & Co., Jackson, Michigan.

SET GARDENER'S TOOLS—1 ENTRY.

Premium, $10—Sprague, Withington & Co., Jackson, Michigan.

DISPLAY OF AGRICULTURAL IMPLEMENTS—2 ENTRIES.

Premium, $25—Sprague, Withington & Co., Jackson, Michigan.

Awarding Committee for Lot 36.—J. W. Fawkes, Lancaster, Pennsylvania; J. B. Hoyt, Madison, Wisconsin; D. J. Powers, Madison, Wisconsin.

LOT NO. 37—ENGINES AND MACHINERY.

TWENTY HORSE POWER STEAM ENGINE, FOR USE DURING THE FAIR—1 ENTRY.

Premium, $100—No award.

GARDEN ENGINE—2 ENTRIES.

Premium, $5—H. W. Austin, agent for Downs & Co., Chicago, Illinois.

WIND MILL AND PUMP FOR FARMERS' USE—3 ENTRIES.

Premium, Gold Medal—United States Wind Engine and Pump Company, Chicago, Illinois.

PUMP FOR WELL—9 ENTRIES.

No award.

PUMP FOR CISTERN—1 ENTRY.

Premium, Silver Medal—H. W. Austin, Chicago, Illinois.

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PORTABLE GRIST MILL—2 ENTRIES.

Premium, $10—Excelsior Burr Stone Grist Mill, Bennett Brothers, New York City.

ONE HUNDRED DRAIN TILES—1 ENTRY.

Premium, Silver Medal—L. H. Harland, for J. Watkins.

MILL FOR GRINDING SUGAR CANE—2 ENTRIES.

Premium, Gold Medal—P. W. Gates & Co., Chicago, Illinois.

SUGAR EVAPORATOR, WITH APPARATUS FOR MAKING SIRUP AND SUGAR—3 ENTRIES.

In relation to the entry by P. W. Gates, Chicago, the Committee say, "Your Committee believe this to be the best Evaporator on exhibition, but not being accompanied with apparatus for making Sugar, do not make award of Premium."

MORTISING MACHINE—1 ENTRY.

Premium, Silver Medal—H. B. Smith, Lowell, Massachusetts—entered by W. K. Manning, Chicago, Illinois.

TENONING MACHINE—1 ENTRY.

Premium, Silver Medal—H. B. Smith, Lowell, Massachusetts, by W. K. Manning, Chicago, Illinois.

SASH MACHINE—1 ENTRY.

Premium, Silver Medal—H. B. Smith, Lowell, Massachusetts, by W. K. Manning, Chicago, Illinois.

STAVE MACHINE—1 ENTRY.

Premium, $10—Hurlburt, Bros. & Co., Chicago, Illinois.

Awarding Committee for Lot 37.—Wait Talcott, Chairman, Rockford, Illinois; Ephraim Briggs, Medina, Ohio; Jonathan Smith, Tiffin, Ohio.

LOT NO. 38—STOVES, CASTINGS AND WORKED METALS.

DISPLAY OF STOVES—3 ENTRIES.

Premium, $20—Allen & Dalton, Chicago, Illinois.

COOKING STOVE FOR WOOD—5 ENTRIES.

Premium, Silver Medal—H. W. Austin, Chicago, Illinois.

COOKING STOVE FOR COAL—4 ENTRIES.

Premium, Silver Medal—A. R. & G. H. Miller, Chicago, Illinois.

PARLOR STOVE—6 ENTRIES.

Premium, Silver Medal—Littlefield's Base Coal Burners—H. C. Vanschaick, Chicago, Illinois.

SHEET IRON—1 ENTRY.

Premium, Silver Medal—Hall, Kimbark & Co., Chicago, Illinois.

BANK LOCK—1 ENTRY.

Premium, Silver Medal—Treasury Bank Lock, Linus Yale, jr., Shelburne Falls, Massachusetts, James Sargeant, agent.

INSIDE LOCK—1 ENTRY.

Premium, Silver Medal—William H. Greenwood, Galva, Illinois.

WINDOW SHUTTER FASTENING—1 ENTRY.

Premium, Silver Medal—Smith & Brother, Chicago, Illinois.

WOOD SCREWS—1 ENTRY.

Premium, Silver Medal—Hall, Kimbark & Co., Chicago, Illinoi

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HORSE SHOES—3 ENTRIES.

Premium, Silver Medal—Hall, Kimbark & Co., Chicago, Illinois.

HORSE SHOE NAILS—1 ENTRY.

Premium, Silver Medal—Hall, Kimbark & Co., Chicago, Illinois.

CUT NAILS—1 ENTRY.

Premium, Silver Medal—Hall, Kimbark & Co., Chicago, Illinois.

LAMPS—1 ENTRY.

Premium, Silver Medal—C. Hammer, Chicago, Illinois.

BAR IRON—1 ENTRY.

Premium, Silver Medal—Hall, Kimbark & Co., Chicago, Illinois.

ROD IRON—1 ENTRY.

Premium, Silver Medal—Hall, Kimbark & Co., Chicago, Illinois.

BLISTERED STEEL—1 ENTRY.

Premium, Silver Medal—Hall, Kimbark & Co., Chicago, Illinois.

REFRIGERATOR—1 ENTRY.

Premium, Silver Medal—Vandervoort, Dickerson & Co., Chicago, Illinois.

Awarding Committee for Lot 38.—D. G. Burr, Chairman, Paris, Illinois; E. Briggs, Medina, Ohio; T. R. Leal, Urbana, Illinois.

LOT NO. 39—VEHICLES, FURNITURE AND HOUSEHOLD IMPLEMENTS.

DISPLAY OF BUGGIES—1 ENTRY.

Premium, $20—H. Willets, Chicago, Illinois.

TWO HORSE CARRIAGES—3 ENTRIES.

Premium, $15—Kinman, Malefyt & Doyles, Chicago, Illinois.

TOP BUGGY—5 ENTRIES.

Premium, $10—E. C. Newton & Co., Batavia, Illinois.

OPEN BUGGY—4 ENTRIES.

No award.

BAROUCHE—1 ENTRY.

Premium, $10—Walter & Haus, Chicago, Illinois.

SET OF OFFICE CHAIRS—1 ENTRY.

Premium, Silver Medal—Wm. W. Strong, Chicago, Illinois.

SET OF PARLOR CHAIRS—1 ENTRY.

Premium, Silver Medal—Wm. W. Strong, Chicago, Illinois.

SET OF COTTAGE FURNITURE—1 ENTRY.

Premium, Silver Medal—Wm. W. Strong, Chicago, Illinois.

DISPLAY OF PARLOR FURNITURE—1 ENTRY.

Premium, $10—Wm. W. Strong, Chicago, Illinois.

CHURN—4 ENTRIES.

Premium, Silver Medal—Union—H. C. Goodrich, Chicago, Illinois.

WASHING MACHINE—4 ENTRIES.

Premium, Silver Medal—Excelsior—S. M. Harris, Chicago, Illinois.

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CLOTHES HORSE—4 ENTRIES.

Premium, $1—Alfred Wyker, Niles, Michigan.

Awarding Committee for Lot 39.—Nicholas Hanson, Augusta, Hancock, county, Illinois; John Deere, Moline, Illinois; Charles O. Nason, Moline, Illinois; J. Stoddard.

LOT NO. 40—MANUFACTURES.

SHINGLES—2 ENTRIES.

Premium, Silver Medal—J. L. Smith, Chicago, Illinois.

WINDOW BLINDS—1 ENTRY.

Premium, Silver Medal—C. T. Boggs, Chicago, Illinois.

DOORS—2 ENTRIES.

Premium, Silver Medal—S. J. Russell, Chicago, Illinois.

DISPLAY OF COOPERS' WORK—3 ENTRIES.

Premium, $5—C. C. Rounds, Chicago, Illinois.

OILS FOR PAINTING—2 ENTRIES.

Premium, Silver Medal—A. E. Goodrich & Co., Chicago, Illinois.

SOLE LEATHER—1 ENTRY.

Premium, Silver Medal—Blackburn Brothers, Chicago, Illinois.

UPPER LEATHER—1 ENTRY.

Premium, Silver Medal—Blackburn Brothers, Chicago, Illinois.

BOUND BOOKS, (ILLINOIS MANUFACTURE)—1 ENTRY.

Premium, $10—D. A. Ingersoll, Chicago, Illinois.

Awarding Committee for Lot 40.—Charles Rich, Metamora, Illinois; J. E. Youngman, Rockford, Illinois; D. O. Daniels, Collinsville, Illinois.

LOT NO. 41—FINE-WORKED METALS, PHILOSOPHICAL APPARATUS AND CUTLERY.

DISPLAY OF WATCHES—1 ENTRY.

Premium, Silver Medal—American Watch Company, Waltham, Massachusetts, Robbins, & Appleton, agents, New York City. Committee say, "Eighteen gold watches, all of great beauty and value."

DISPLAY OF PLATED WARE—3 ENTRIES.

Premium, Silver Medal—John Hughes, Chicago, Illinois. Committee say, "Of exquisite beauty and finish."

Awarding Committee for Lot 41.—David L. Phillips, Springfield, Illinois; John E. McClun, Bloomington, Illinois; D. G. Burr, Paris, Illinois.

SUPPLEMENTAL TO CLASS F.—FIREARMS.

MUZZLE-LOADING RIFLE CANNON, SIX-POUNDER—1 ENTRY.

Premium, Grand Gold Medal—Norman Wiard, New York City, for Wiard's Steel Rifle Cannon.

BREECH-LOADING RIFLE FOR INFANTRY SERVICE—3 ENTRIES.

Premium, Gold Medal—Cheney Brothers, Hartford, Connecticut.

BREECH-LOADING CARBINE, FOR CAVALRY SERVICE—2 ENTRIES.

Premium, Gold Medal—New Haven Arms Company, Wm. C. Stanton, agent, New Haven, Connecticut.

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TARGET RIFLE—5 ENTRIES.

Premium, Silver Medal—William Jones, Rockford, Illinois.

SOLID SH 'T FOR RIFLED CANNON—2 ENTRIES.

Premium, Silver Medal—Hotchkiss & Sons, Sharon, Connecticut.

SHELLS FOR RIFLE CANNON—1 ENTRY.

Premium, Silver Medal—Hotchkiss & Sons, Sharon, Connecticut.

[N. B. The miscellaneous entries in this lot were very numerous, and will be noticed by the Executive Committee at the January meeting, 1862.]

Awarding Committee for Supplement to Class F.—Col. Austin Light, Camp Mather; A. C. Stedman, Dixon, Illinois; Capt. H. Gotteg, Chicago, Illinois; Perry H. Smith, Chicago, Illinois.

CLASS G—FARM PRODUCTS.

LOT NO. 42—GRAIN AND VEGETABLES.

White Winter Wheat—3 entries:
First Premium, $10—Henry Neal, Waukegan, Illinois.
Second Premium, $5—E. C. Stevens, Antioch, Illinois.

Red Winter Wheat, one Bushel—3 entries:
First Premium, $10—A. S. Barnard, Naperville, Illinois.
Second Premium, $5—Henry Neal, Waukegan, Illinois.

Spring Wheat, one Bushel—5 entries:
First Premium, $10—William George, Garden Plain, Illinois.
Second Premium, $5—S. W. Arnold, Cortland, Illinois.

Rye, one Bushel—1 entry:
First Premium, $5—E. C. Stevens, Antioch, Illinois.

Oats, one Bushel—3 entries:
First Premium, $5—E. C. Stevens, Antioch, Illinois.

Spring Barley—4 entries:
First Premium, $5—J. W. Switzer, Elgin, Illinois.
Second Premium, Wheat Plant—Horace Messenger, jr., Lockport, Illinois.

Different Varieties Indian Corn in the Ear, one Bushel each—2 entries:
First Premium, $10—L. E. Gordon, Hayworth, Illinois.

[In relation to the entry by C. W. Murtfeldt, of Oregon, Illinois, Committee say, "Greatest number of, and best varieties, but not the required amount of each veriety to entitle it to a premium."]

Corn on the Stalk—1 entry:
First Premium, $5—L. E. Gordon, Hayworth, Illinois.

Buckwheat, one Bushel—1 entry:
First Premium, $5—Miriam Smith, Wayne, Illinois.

Timothy Seed, one Bushel—3 entries:
First Premium, $5—Miriam Smith, Wayne, Illinois.
Second Premium, Wheat Plant—E. C. Stevens, Antioch, Illinois.

Clover Seed, one Bushel—2 entries:
First Premium, $5—A H. Hanley, McHenry, Illinois.
Second Premium, Wheat Plant—Wilber, Emery & Co., Chicago, Illinois.

Early Potatoes, one Bushel—4 entries:
First Premium, $5—L. E. Gordon, Hayworth, Illinois.
Second Premium, Wheat Plant—Jonathan Periam, Hope, Illinois.

Late Irish Potatoes, one Bushel—6 entries:
First Premium, $5—S. W. Arnold, Cortland, Illinois.

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Sweet Potatoes, one Bushel—2 entries:

First Premium, $5—Newhall & Clark, South Pass, Illinois.
Second Premium, Wheat Plant—Jonathan Periam, Hope, Illinois.

Onions, one Peck—4 entries:

First Premium, $3—S. Wilber, Momence, Illinois.
Second Premium, Agricultural Periodical—Gage Bros. & Drake, Chicago, Illinois.

Table Beets, one Bushel—2 entries:

First Premium, $3—S. Wilber, Momence, Illinois.
Second Premium, Agricultural Periodical—Gage Bros. & Drake, Chicago, Illinois.

Table Parsnips, one Bushel—3 entries:

First Premium, $3—S. Wilber, Momence, Illinois.

Salsify, three Bunches—1 entry:

First Premium, $3—Gage Bros. & Drake, Chicago, Illinois.

Celery, twelve Stalks—2 entries:

First Premium, $3—Gage Bros. & Drake, Chicago, Illinois.
Second Premium, Agricultural Periodical—Fred. Voltz, Chicago, Illinois.

Cauliflower, six Heads—2 entries:

First Premium, $3—Gage Bros. & Drake, Chicago, Illinois.
Second Premium, Agricultural Periodical—Fred. Voltz, Chicago, Illinois.

Cabbage, six Heads—5 entries:

First Premium, $3—E. Peacock, Chicago, Illinois.
Second Premium, Agricultural Periodical—Jonathan Periam, Hope, Illinois.

Tomatoes, one Peck—5 entries:

First Premium, $3—S. Wilber, Momence, Illinois.
Second Premium, Agricultural Periodical—J. Periam, Hope, Illinois.

Egg Plant, six Eggs—2 entries:

First Premium, $3—Gage Bros. & Drake, Chicago, Illinois.
Second Premium, Agricultural Periodical—J. T. Little, Dixon, Illinois.

Peppers, one Peck—3 entries:

First Premium, $3—J. Periam, Hope, Illinois.

Lima Beans—4 entries:

First Premium, $3—J. Periam, Hope, Illinois.

Bunch Beans, one Peck—5 entries:

First Premium, $3—E. C. Stevens, Antioch, Illinois.
Second Premium, Agricultural Periodical—J. Periam, Hope, Illinois.

Field Peas, one Peck—4 entries:

First Premium, $3—S. W. Arnold, Cortland, Illinois.
Second Premium, Agricultural Periodical—J. Periam, Hope, Illinois.

Greatest variety Garden Peas—2 entries:

First Premium, $3—S. Wilber, Momence, Illinois.
Second Premium, Agricultural Periodical—J. Periam, Hope, Illinois.

Pumpkins—1 entry:

First Premium, $3—J. Periam, Hope, Illinois.

Squashes—4 entries:

First Premium, $3—J. Periam, Hope, Illinois.
Second Premium, Agricultural Periodical—Gage Bros. & Drake, Chicago, Illinois.

Water Melons—1 entry:

First Premium, $3—Gage Bros. & Drake, Chicago, Illinois.

Carrots, one Bushel—3 entries:

First Premium, $3—S. Wilber, Momence, Illinois.
Second Premium, Agricultural Periodical—Gage Bros. & Drake, Chicago, Illinois.

Variety of Vegetables by one Person—4 entries:

First Premium, $10—S. Wilber, Momence, Illinois.
Second Premium, $5—J. Periam, Hope, Illinois.

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Named Garden Seeds raised in Illinois—1 entry:
First Premium, $5—S. Wilber, Momence, Illinois.

Spring Wheat twenty Bushels—2 entries:
Premium, $50—S. W. Arnold, Cortland, Illinois.

LOT NO. 43.—FLOUR, STARCH, ETC.

Flour, one Barrel—5 entries:
First Premium, $10—Hawkins & Chapman, Chicago, Illinois.
Second Premium, $5—Hawkins & Chapman, Chicago, Illinois.

Awarding Committee for Lots 42 *and* 43.—Peter Sweat, Peoria, Illinois; Daniel Frost, Lee Centre, Illinois; E. F. Smith, ———; W. H. Gardner, Amboy, Illinois.

LOT NO. 44.—BUTTER, CHEESE, BREAD, ETC.

Twenty-five Pounds Butter in Firkin, made at any time during the year—7 entries:
First Premium, $10—Mrs. L. Wilmot, Deerfield, Lake county, Illinois.
Second Premium, $5—Wm. Ritchie, Chicago, Illinois.

Twenty Pounds May or June Butter—8 entries:
First Premium, $20—Mrs. L. Wilmot, Deerfield, Illinois.
Second Premium, $10—R. F. Clough, Elk Grove, Cook county, Illinois.

Ten Pounds Fresh Butter in Roll—4 entries:
First Premium, $5—W. Ritchie, Chicago, Illinois.
Second Premium, Agricultural Periodical—Miss L. Hastings, Chicago, Illinois.

Cheese one year old—1 entry:
First Premium, $10—Charles Rich, Metamora, Illinois.

Cheese under one year old—2 entries:
First Premium, $5—James Snyder, Morrison, Illinois.
Second Premium, $3—C. Goudy, Waukegan, Illinois.

Lot Honey not less than ten Pounds—11 entries:
First Premium, $5—B. W. Tuttle, Galena, Illinois.
Second Premium, $2—Lewis Dodge, Chicago, Illinois.

Two Loaves Wheat Bread, (Hop Yeast)—3 entries:
First Premium, $5—Mrs. Wm. J. Stockdale, Springfield, Illinois.
Second Premium, $2—Mrs. W. H. Butler, Chicago, Illinois.

Two Loaves Wheat Bread, (Milk Rising)—5 entries:
First Premium, $5—Mrs. Floyd Higgins, Chicago, Illinois.
Second Premium, $2—Mrs. M. F. Hastings, Chicago, Illinois.

Two Loaves of Bread from Unbolted Flour—3 entries:
First Premium, $5—Mrs. W. H. Butler, Chicago, Illinois.
Second Premium, $2—Mrs. D. N. Burnham, Chicago, Illinois.

Two Loaves Rye Bread—1 entry:
First Premium, $5—Mrs. M. F. Hastings, Chicago, Illinois.

Sponge Cake—3 entries:
First Premium, $2—Mrs. S. Fowler, Chicago, Illinois.
Second Premium, $1—Mrs. W. H. Butler, Chicago, Illinois.

Fruit Cake—1 entry:
First Premium, $2—Mrs. L. Benedict, Chicago, Illinois.

Sour Pickled Cucumbers—2 entries:
Premium, $1—Chas. Kohler & Co., Chicago, Illinois.

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Cucumber Catsup—1 entry:
Premium, $1—Mary C. Williams, Chicago, Illinois.

Awarding Committee for Lot 44.—J. N. Wetmore, Chairman, Ontario, Knox county, Illinois. (Other names do not appear on the book.—Sec.)

Special Committee on Honey and Bee Hives.—M. Pardue, D. K. Murtfeldt, L. H. Robinson, L. H. Roots.

CLASS H—HORTICULTURE.

LOT NO. 45—TREES AND FRUIT.

Display of Fruit and Deciduous Ornamental Trees from Nursery—2 entries:
Premium, $20—Overman & Mann, Bloomington, Illinois.

Display of Ornamental Shrubs from Nursery—1 entry:
Premium, $20—J. T. Little, Dixon, Illinois.

Display of Hardy Evergreen Trees from Nursery—1 entry:
Premium, $20—T. F. Baldwin, Chicago, Illinois.

Collection of Apples, not less than twenty-five varieties—7 entries:
First Premium, $20—Arthur Bryant, Princeton, Illinois.
Second Premium, $10—J. T. Little, Dixon, Illinois.

Fifteen varieties of Apples for Cultivation in Northern Illinois—8 entries:
First Premium, $10—J. T. Little, Dixon, Illinois.
Second Premium, $5—Arthur Bryant, Princeton, Illinois.

Greatest variety Siberian Crab Apples—4 entries:
Premium, $3—J. T. Little, Dixon, Illinois.

Collection of Apples by Farmer or Amateur—5 entries:
First Premium, $10—Clark Chatten, Payson, Adams county, Illinois.
Second Premium, $5—B. B. Drake, Elk Grove, Cook county, Illinois.

Collection of Peaches by Farmer or Amateur—1 entry:
First Premium, $5—Clark Chatten, Payson, Illinois.

Collection of Plums by Farmer or Amateur—2 entries:
First Premium, $5—A. S. Sherman, Waukegan, Illinois.
No second premium awarded.

Collection of Pears grown in Illinois, not less than ten varieties—2 entries:
First Premium, $15—Robert Douglass, Waukegan, Illinois.
Second Premium, $3—C. H. Hibbard, Marengo, Illinois.

Collection of Autumn Pears, not less than six varieties, grown in Illinois—6 entries:
First Premium, $10—D. F. Kinney, Rock Island, Illinois.
Second Premium, $5—B. F. Long, Alton, Illinois.

Collection of Winter Pears, not less than three varieties, grown in Illinois—3 entries:
Premium, $5—Robert Douglass, Waukegan, Illinois.

Best and Greatest variety of Peaches—3 entries:
First Premium, $10—Clark Chatten, Payson, Illinois.
Second Premium, $5—Starr Brothers, Alton, Illinois.

Committee say, "Mr. Chatten had many good varieties, true to name, more than any other exhibitor, but his lot was disfigured by many varieties incorrectly named."

Best six varieties of Peaches—5 entries:
First Premium, $5—George Booth, Alton, Illinois.
Second Premium, $3—Starr Bros., " "

Collection of Plums—1 entry:
First Premium, $5—C. E. Peck, Winetka, Illinois.

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Twelve Specimens Quinces—2 entries:

First Premium, $3—Robert Dorey, Shiloh, Illinois.
Second Premium, $2—Robert Douglass, Waukegan, Illinois.

Collection of Autumnal Raspberries—1 entry:

First Premium, $3—W. S. Steel, Evanston, Illinois.

Best and Greatest variety of Native Grapes, not less than six Bunches each—5 entries:

First Premium, $10—H. L. Brush, Ottawa, Illinois.
Second Premium, $5—Charles H. Rosenstiel, Freeport, Illinois.

Best and Greatest variety of Foreign Grapes grown under Glass, not less than six Bunches each—3 entries:

First Premium, $10—J. C. Ure, gardener, to I. N. Arnold, Chicago, Illinois.
Second Premium,—A. T. Williams, Chicago, Illinois.

Awarding Committee for Lot 45.—B. G. Roots, Chairman, Tamaroa, Illinois; F. K. Phœnix, Bloomington, Illinois; S. G. Minkler, Specie Grove, Illinois; L. Woodard, Marengo, Illinois; Adnah Williams, Galesburg, Illinois.

LOT NO. 46—CANNED AND PRESERVED FRUITS.

Fresh Peaches in Cans or Glass—5 entries:

First Premium, $5—Fred Exter, Shiloh, Illinois.
Second Premium, $2—Mrs. H. H. Yates, Chicago, Illinois.

[NOTE.—The Entry in this lot by Mrs. N. P. Iglehart, was of peaches canned in 1859; Committee recommend a premium.]

Pears in cans or Glass—4 entries:

First Premium, $5—Fred. Exter, Shiloh, Illinois.
Second Premium, $2—Mrs. N. P. Iglehart, Chicago, Illinois.

Plums in Cans or Glass—3 entries:

First Premium, $3—Mrs. N. P. Iglehart, Chicago, Illinois.

Cherries in Cans or Glass—3 entries:

First Premium, $3—Mrs. Martha L. Drake, Chicago, Illinois.
Second Premium, $2—George Thompson, Geneva, Illinois.

Currants in Cans or Glass—8 entries:

First Premium, $3—George Thompson, Geneva, Illinois.
Second Premium, $2—Mrs. H. H. Yates, Chicago, Illinois.

Strawberries in Cans or Glass—8 entries:

Premium, $3—Mrs. Frank Williams, Chicago, Illinois.

Display of Fresh Canned Fruits—1 entry:

Premium, $10—Fred. Exter, Shiloh, St. Clair county, Illinois.

Peaches in Sugar—5 entries:

First Premium, $2—Mrs. J. E. Reynolds, Chicago, Illinois.
Second Premium, $1—Mrs. N. P. Iglehart, Chicago, Illinois.

Plums in Sugar—3 entries:

First Premium, $2—Mrs. Frank Williams, Chicago, Illinois.
Second Premium, $1—George Thompson, Geneva, Illinois.

Siberian Crab Apples in Sugar—3 entries:

First Premium, $2—Mrs. Charles Rich, Metamora, Illinois.
Second Premium, $1—Mrs. Frank Williams, Chicago, Illinois.

Pears in Sugar—3 entries:

First Premium, $2—Mrs. Frank Williams, Chicago, Illinois.
Second Premium, $1—Mrs. N. P. Iglehart, Chicago, Illinois.

Cherries in Sugar—1 entry:

First Premium, $1—George Thompson, Geneva, Illinois.

Strawberries in Sugar—2 entries:

First Premium, $2—Mrs. J. E. Reynolds, Chicago, Illinois.
Second Premium, $1—George Thompson, Geneva, Illinois.

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Crab Apple Jelly—1 entry:
Premium $2—George Thompson, Geneva, Illinois.

Plum Jelly—1 entry:
Premium, $2—George Thompson, Geneva, Illinois.

Quince Jelly—1 entry:
Premium, $2—Mrs. N. P. Iglehart, Chicago, Illinois.

Currant Jelly—6 entries:
Premium, $2—Mrs. E. Little, Amboy, Illinois.

Awarding Committee for Lot 46.—Peter Sweat, Chairman, Peoria, Illinois; Mrs. W. S. Wait, Greenville, Illinois; Mrs. J. E. Bennet, Morrison, Illinois; Mrs. ——— Bosworth, Chicago, Illinois; Prof. McChesney, Chicago, Illinois; Henry Shaw, Tremont, Illinois.

LOT NO. 47—NATIVE WINES, CIDER AND VINEGAR.

Three Bottles Wine from some Grape other than Catawba or Isabella—6 entries.
Premium, $10—Peter Sweat, Peoria, Illinois.

Three Bottles Currant Wine—10 entries:
Premium, $10—B. F. Long, Alton, Illinois.

Three Bottles Rhubarb Wine—3 entries:
Premium, $3—E. A. Carter, Chicago, Illinois.

Twelve Bottles Cider—1 entry:
Premium, $3—W. H. Hutchinson & Co., Chicago, Illinois.

Six Bottles Vinegar—4 entries:
Premium, $3—S. G. Minkler, Specie Grove, Illinois.

[There were several entries of Catawba and Isabella wines in the regular list, and some also as miscellaneous. No premiums were awarded on them, and Committee say of these and some other samples from currants, that they consider the too free use of sugar and want of age, *the great faults in most of the samples.*]

Awarding Committee for Lot 47.—Dr. John A. Kennicott, Chairman, The Grove, Illinois; C. W. Murtfeldt, Oregon, Illinois; Dr. Helmuth, Chicago, Illinois; Dr. Scammon, Chicago, Illinois; Charles H. Rosenstiel, Freeport, Illinois; on lots in which he was not an exhibitor.

LOT NO. 48—FLOWERS AND PLANTS.

Begonias—1 entry:
First Premium, $10—J. C. Ure, Chicago, Illinois.

Collection of Green-house Plants in Bloom—1 entry:
First Premium, $20—A. T. Williams, Chicago, Illinois.

Display of Pansies in Bloom—2 entries:
First Premium, $2—W. S. Steel, Evanston, Illinois.

Variety of Named Dahlias—2 entries:
First Premium, $10—Robert Douglass, Waukegan, Illinois.
Second Premium, $5—J. T. Little, Dixon, Illinois.

Twelve Dissimilar Blooms—2 entries:
First Premium, $5—Robert Douglass, Waukegan, Illinois.
Second Premium, $3—Edgar Sanders, Chicago, Illinois.

Pyrmidal Dahlia Boquet—2 entries:
Premium, $5—Robert Douglass, Waukegan, Illinois.

Variety Verbenas in Bloom—2 entries:
First Premium, $5—A. T. Williams, Chicago, Illinois.
Second Premium, $1—Edgar Sanders, Chicago, Illinois.

Variety of Asters in Bloom—1 entry:
First Premium, $2—Mrs. H. H. Yates, Chicago, Illinois.

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Awarding Committee for Lot 48.—Arthur Bryant, Chairman, Princeton, Illinois; Miss Alice Kennicott, The Grove, Illinois; E. A. Floyd, ——; E. Reese, Naperville, Illinois; James Crow, Crystal Lake, Illinois; C. E. Peck, Winetka, Illinois.

LOT NO. 49—FLORAL DESIGNS AND BOQUETS.

Floral Wreath—1 entry:

Premium, $2—Mrs. M. L. Hull, Chicago, Illinois.

Variety of Named Flowers—4 entries:

First Premium, $10—Mrs. J. Cobb, Waukegan, Illinois.
Second Premium, $5—Edgar Sanders, Chicago, Illinois.
Third Premium, $3—Mrs. H. H. Yates, Chicago, Illinois.

Pair of Flat Bouquets—3 entries:

First Premium, $2—D. Bonnard, Chicago, Illinois.
Second Premium, $1—Edgar Sanders, Chicago, Illinois.

Pair Round Bouquets—3 entries:

First Premium, $2—D. Bonnard, Chicago, Illinois.
Second Premium, $1—A. T. Williams, Chicago, Illinois.

Variety of Named Wild Flowers—1 entry:

Premium, $3—Mrs. J. B. Cobb, Waukegan, Illinois.

Awarding Committee for Lot 49.—Arthur Bryant, Chairman, Princeton, Illinois; Samuel Edwards, La Moille, Illinois; James Crow, Crystal Lake, Illinois; E. A. Floyd, ——; C. E. Peck, Winetka, Illinois.

CLASS I—FINE ARTS.

LOT NO. 50—MUSICAL INSTRUMENTS.

Violin—1 entry:

Premium, $2—Julius Bauer, Chicago, Illinois.

Flute—1 entry:

Premium, $2—Julius Bauer, Chicago, Illinois.

Clarionet—1 entry:

Premium, $2—Julius Bauer, Chicago, Illinois.

Set of Band Instruments—1 entry:

Premium, $5—Julius Bauer, Chicago, Illinois.

Collection of Musical Instruments:

Premium, Gold Medal—Julius Bauer, Chicago, Illinois.

LOT NO. 51—SCULPTURE, PAINTING AND DRAWING.

Specimen of Sculpture—1 entry:

Premium, $5—Earnshaw & Marshall, Chicago, Illinois.

Illinois Landscape in Oil—5 entries:

Premium, $50—George James Robertson, Rockford, Illinois.

Fancy Painting in Oil—7 entries:

Premium, $10—Mrs. Mary A. Bush, Chicago, Illinois.

Cattle Piece in Oil—1 entry:

Premium, $20—Simeon P. Tracy, Chicago, Illinois.

Animal Painting in Oil—3 entries:

Premium, $20—Ben. Cooley, Quincy, Illinois.

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Electrotyping—1 entry:
Premium, $5—A. Zeese & Co., Chicago, Illinois.

Lithography—5 entries:
Premium, $10—Edward Mendell, Chicago, Illinois.

[Committee say, Mr. M. "has the greatest variety on exhibition. The specimens of E. Whitefield being confined to specimens in one branch of art *Landscape*, are commended as being superior to any in that particular branch."]

Wood Engraving—3 entries:
Premium, $5—W. D. Baker, Chicago, Illinois.

Fruit Painting in Water Colors—2 entries:
Premium, $5—E. Whitefield, Chicago, Illinois.

Flower Painting in Water Colors—4 entries:
Premium, $5—E. Whitefield, Chicago, Illinois.

Bird Painting in Water Colors—1 entry:
Premium, $5—E. Whitefield, Chicago, Illinois.

Crayon Pencil Sketch—12 entries:
Premium, $5—L. James Ferris, Rock Island, Illinois.

Monochromes—4 entries:
Premium, $5—Cyrus J. Ward, Chicago, Illinois.

Ambrotypes—4 entries:
Premium, $10—C. W. Florence, Chicago, Illinois.

Photographs—7 entries:
Premium, $10—Wm. Shaw, Chicago, Illinois.

Colored Photographs—3 entries:
Premium, $15—C. W. Florence, Chicago, Illinois.

Topography—2 entries:
Premium, $5—Burhans & Van Vechten, Chicago, Illinois.

Penmanship—5 entries:
Premium, $5—Bryant & Stratton, Chicago, Illinois.

Drawings, Plan and Specifications for School House, having reference to Heating and Ventillation—2 entries:
Premium $15—G. P. Randall, Chicago, Illinois.

Awarding Committee for Lots Nos. 50 *and* 51.—E. H. Bebee, Chairman, Galena Illinois; J. H. McChesney, Chicago, Illinois; D. S. Morse, Paxton, Illinois; D. M. Thompson, Eustace, Illinois; M. S. Bebb, Springfield, Illinois.

CLASS K—TEXTILE FABRICS.

LOT NO. 52—MILL FABRICS AND MATERIALS.

Five Samples of Fine Wool—1 entry:
Premium, $5—Frank Brownlee, Little York, Illinois.

Five Samples of Coarse Wool—3 entries:
Premium, $5—P. G. Bauder, New Milford, Illinois.

One Pound Sewing Silk—1 entry:
Premium, $5—Cheney Brothers, Hartford, Connecticut.

One Pound Woolen Yarn—1 entry:
Premium, $3—Mrs. Sarah Kinney, Bloomingdale, Illinois.

HOUSEHOLD FABRICS.

Display of Domestic Woolen Goods—2 entries:
Second Premium, $5—J. W. Switzer, Elgin, Illinois.
Third Premium, $3—George Holt, Chicago, Illinois.

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Display of Men's Clothing—1 entry:

Premium, $10—G. F. Belding & Co., Chicago, Illinois.

Display of Boots and Shoes—2 entries:

Premium, $10—P. Hawkins, Chicago, Illinois.

Display of Hoop Skirts—1 entry:

Premium, $10—A. G. Downs, Chicago, Illinois.

Awarding Committee for Lot 52.—D. K. Lincoln, Chairman, Round Grove, Illinois; Mrs. D. K. Lincoln, Round Grove, Illinois; Mrs. C. D. Sanford, Mrs. Nathan Beadles, Lewiston, Illinois.

LOT NO. 53—NEEDLE, SHELL AND WAX WORK—SEWING AND KNITTING MACHINES.

Plain Knitting—18 entries:

First Premium, $8—Geo. Holt, Chicago, Illinois.
Second Premium, $5—V. B. Becraft, Jacksonville, Illinois.
Third Premium, $3—Mrs. H. M. Reynolds, Chicago, Illinois.

Plain Sewing—16 entries:

First Premium, $10—Mrs. M. M. Van Deusen, Springfield, Illinois.
Second Premium, $5—Mrs. W. H. Mann, Bloomington, Illinois.
Third Premium, $3—Miss Cora M. Adams, (8 years old,) Batavia, Illinois.

Crochet or Fancy Knitting—32 entries:

Half of First Premium, $5—Louise Booker, Chicago, Illinois.
Half of First Premium, $5—Mrs. P. Williams, Chicago, Illinois.
Second Premium, $5—Mrs. S. L. Williams, Chicago, Illinois.
Third Premium, $3—Miss Flora Leonard, Chicago, Illinois.

Most Tastefully Executed Quilt or Coverlet—31 entries:

First Premium, $10—Mrs. S. R. Page, Champaign, Illinois.
Second Premium, $5—Mrs. Amasa Morse, Lisle, Illinois.
Third Premium, $3—Miss Hannah E. Stacy, Jacksonville, Illinois.

Lace Work or Hemstiching—3 entries:

Second Premium, $5—Mrs. M. M. VanDeusen, Springfield, Illinois.
No first or third premium awarded.

Ladies' Embroidered Slippers—4 entries:

Premium, $5—Isabella Pinkerton, Chicago, Illinois.

Worsted Embroidery—16 entries:

First Premium, $8—Sutton & Berkell, Chicago, Illinois.
Second Premium, $3—Mrs. T. H. Hicks, Warren, Illinois.
Third Premium, $3—Mrs. J. Abbe, Quincy, Illinois.

Needle Work or Floss Embroidery—17 entries:

First Premium, $10—Mrs. Cora M. Emerson, Chicago, Illinois. (Committee say: "This is of surpassing beauty and superb workmanship.")
Second Premium, $5—Mrs. T. C. Estee, Chicago, Illinois.
Third Premium, $3—Mrs. E. Little, Amboy, Illinois.

Silk Embroidery—11 entries:

First Premium, $10—Mrs. E. Little, Amboy, Illinois.
Second Premium, $5—Mrs. P. O. Loucks, Peoria, Illinois.
Third Premium, $3—Mrs. M. M. VanDeusen, Springfield, Illinois.

Most Tasteful Display of Work in Wax, Feathers, Hair, Crape, Spice, etc.—13 entries:

First Premium, $10—Hair Work, by A. Opswaldt, Chicago, Illinois.
Second Premium, $8—Hair Work, by Miss H. A. Case, Waukegan, Illinois.
Third Premium, $5—Hair Work, Gertrude A. Reynolds, Chicago, Illinois.

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[NOTE.—For the Premium offered for "best specimen of machine sewing or stiching done in presence of the committee," there were three entries, but the committee prefer the "Leavitt & Co.'s Machine," which was not entered for competition in this Lot, and recommend the award of a Silver Medal to said machine. Also, for the premium offered for "best specimen of sewing done in presence of the committee *by the lowest priced machine* for family use," there were two entries. The committee make no award, but recommend the award of Silver Medal to the "Ladd, Webster & Co. Machine," which was not entered for competition in this Lot.—*Sec'y.*]

Best Knitting Machine—2 entries:

Premium, $10—G. P. Sherman, Milwaukee, Wisconsin.

Best Specimen of Knitting done in presence of the Committee—2 entries:

Premium, $5—G. P. Sherman, Milwaukee, Wisconsin.

Awarding Committee for Lot 53.—A. J. Tuller, Chairman, Prophetstown, Illinois; Mrs. R. McConnell, Mrs. J. M. Cobleigh, Mrs. H. C. Johns, Mrs. Finney—on Fabrics.

A. J. Tuller, Chairman; Mrs. J. M. Cobleigh, Mrs. H. C. Johns, Mrs. Whitney, Mrs. Louise D. Parks, Capt. Tucker and Capt. Gray—on Sewing Machines.

CLASS L—NATURAL HISTORY.

LOT NO. 54—BOTANY AND GEOLOGY.

Collection Illustrating the Botany of Illinois, not less than 500 Named Species—3 entries:

Premium, $75—Geo. Vasey, Ringwood, Illinois.

Collection Illustrating the Geology of Illinois—2 entries:

Premium, $75—J. H. McChesney, Chicago, Illinois.

LOT NO. 55—ZOOLOGY.

Collection in Ornithology of Illinois, not less than 75 Named Species—3 entries:

Premium, $75—Fred. Kempfer, Chicago, Illinois.

Collection Illustrating the Conchology of Illinois, not less than 50 Named Species—4 entries:

Premium, $50—M. S. Bebb, Springfield, Illinois.

Collection Illustrating the Entomology of Illinois, not less than 1,000 Species Named:

Premium, $75—B. D. Walsh, Rock Island, Illinois.

Awarding Committee for Lots 54 *and* 55.—J. B. Turner, Chairman, Jacksonville, Illinois; James P. Weston, Galesburg, Illinois; I. A. Lapham, Milwaukee, Wisconsin; W. H. Ryder, Chicago, Illinois.

MISCELLANEOUS.

CLASS F.

Rotary Harrow:

John Walker, Blue Island, Illinois. Highly commended.

Spring Shovel, for Drill:

[illegible] Highly commended.

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Grass and Grain Scythes:
Wilber, Emery & Co., Chicago, Illinois. Very highly commended.

Lot Grain and Grass Scythes:
Sprague, Withington & Co., Jackson, Michigan. Highly commended.

Improved Reel for Harvesters:
Geo. S. Curtis, Chicago, Illinois. Very highly commended.

Lot Cast-steel Ladies' Hoes:
Sprague, Withington & Co., Jackson, Michigan. Very highly commended.

Lot Four-Teeth Weeding Hoes—Cast-steel:
Sprague, Withington & Co., Jackson, Michigan. Highly commended.

Lot Solid Shank Cast-steel Hoes:
Sprague, Withington & Co., Jackson, Michigan. Highly commended.

Lot Solid Socket Cast-steel Hoes:
Sprague, Withington & Co., Jackson, Michigan. Highly commended.

Lot Cast-steel Garden Rakes—Five kinds:
Sprague, Withington & Co., Jackson, Michigan. Highly commended.

Lot Tobacco Hoes, Solid Shank—Three kinds:
Sprague, Withington & Co., Jackson, Michigan. Highly commended.

Lot Iron Garden Rakes—Three kinds:
Sprague, Withington & Co., Jackson, Michigan. Highly commended.

One Lot Six-Tooth Weeding Hoes, Cast-steel:
Sprague, Withington & Co., Jackson, Michigan. Highly commended.

Lot Cast-steel Four Tined Barley Forks:
Sprague, Withington & Co., Jackson, Michigan. Highly commended.

Lot Cast-steel Four Tined Forks for Manure, with Strap Ferrules, D and Long Handle:
Sprague, Withington & Co., Jackson, Michigan. Highly commended.

Lot Cast-steel Four Tined Forks, D and Long Handles:
Sprague, Withington & Co., Jackson, Michigan. Highly commended.

Lot Cast-steel Three Tined Forks, Strap Ferrules:
Sprague, Withington & Co., Jackson, Michigan. Highly commended.

Lot Cast-steel Three Tined Forks:
Sprague, Withington & Co., Jackson, Michigan. Highly commended.

Cast-steel Two Tined Hay Forks:
Sprague, Withington & Co., Jackson, Michigan. Highly commended.

Lot Eight Tined Sluice Forks, Square Tined, for California, &c.:
Sprague, Withington & Co., Jackson, Michigan. Highly commended.

Lot Diamond Eight Tined Sluice Forks, for Australia and California Mining:
Sprague, Withington & Co., Jackson, Michigan. Highly commended.

Lot Grain Cradles, Assorted:
Sprague, Withington & Co., Jackson, Michigan. Highly commended.

Lot Scythe Snaths, Assorted kinds:
Sprague, Withington & Co., Jackson, Michigan. Highly commended.

Best Patent Pick:
J. Hyde Fisher, Chicago, Illinois. Highly commended.

Excelsior Buhr Stone Mill, for Feed:
Bennett Brothers, New York City. Highly commended.

One Model for Eight Horse Power:
Bennett Brothers, New York City. Highly commended.

Equalizer for Horse Power:
N. A. Pitts & Co., Chicago, Illinois. Highly commended.

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Bale of Hay, to Exhibit quality of Baling:
H. A. Watkins & Bro., Galesburg, Illinois. Highly commended.

One Dozen Hand Rakes:
O. W. Clarke, Appleton, Wisconsin. Very highly commended.

Machine to Separate Oats from Wheat:
T. H. McCulloch, Peoria, Illinois. Highly commended.

Combined Thresher, Corn Sheller and Grinding Mill:
J. W. Eddy, Batavia, Kane county, Illinois. Highly commended.

Burson's American Grain Binder:
H. W. Burson, Annawan, Henry county, Illinois. Highly commended.

Cider Mill:
Wilber, Emery & Co., Chicago, Illinois. Highly commended.

Plowing Machine:
J. M. Farrar, Manchester, New Hampshire. Very highly commended.

Blind Stile Boring and Staple Driving Machine:
H. B. Smith, Lowel, Massachusetts; W. K. Manning, Chicago, Illinois. Very highly commended.

One Model of Sleeping Car:
J. Hyde Fisher, Chicago, Illinois. Very highly commended.

Machine for Grinding Knives and Scissors:
Hyatt, Bros. & Co., Chicago, Illinois. Very highly commended.

Assortment Steel Composition Bells:
Brown & White, New York City. Very highly commended.

Barrison's Patent Apparatus for Ringing Bells:
Brown & White, New York City. Highly commended.

Model Water Wheel:
Milton Dilts, Columbus City, Indiana. Very highly commended.

Rotary Wrench with Adjustable Jaws:
G. W. Norton, Earlville, Illinois. Very highly commended.

One Beveling Jointer:
William Watkins, Crete, Illinois. Very highly commended.

Sheep Shearing Machine:
O. Hubbel, Geneva, Wisconsin. Very highly commended.

Circular Saw:
John Tear, Chicago, Illinois. Very highly commended.

Steam Valve:
D. R. Prindle, East Bethany, New York. Very highly commended.

Andrew Derrom's Portable House:
John Drew, Chicago, Illinois. Very highly commended.

Water Elevator:
John C. Hall, Pontiac, Michigan. Very highly commended. (F. B. McGregor & Co.'s)

Well Bucket:
R. W. Hunt, Galesburg, Illinois. Highly commended.

One Hot Air Furnace:
O. Woodin, Jackson, Michigan. Commended.

Bent Iron Rail:
George Dunlap, Chicago, Illinois. Commended.

Combined Water Filterer and Cooler:
G. B. Davis, Chicago, Illinois. Commended.

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Thimble and Skeins for Wagons:
Lange, Brown & Co., Chicago, Illinois. Highly commended.

Wagon Tire Bender:
Lange, Brown & Co., Chicago, Illinois. Commended.

Improved Seamless Thimble Skeins and Boxes:
Hall, Kimbark & Co., Chicago, Illinois. Commended.

Plow Steel Slabs:
Hall, Kimbark & Co., Chicago, Illinois.

Cast-Steel:
Hall, Kimbark & Co., Chicago, Illinois.

Anvils and Vises:
Hall, Kimbark & Co., Chicago, Illinois. Commended.

Pressed Spikes, Rivets, Bolts, Nuts and Washers:
Hall, Kimbark & Co., Chicago, Illinois. Commended.

Hoop-Iron:
Hall, Kimbark & Co., Chicago, Illinois. Commended.

Seven Game Traps:
Edward Kushensky, Chicago, Illinois. Commended.

Set of Tools for Repairing Telegraph Wires, and other Purposes:
J. Hyde Fisher, Chicago, Illinois. Commended.

Hickory Spokes:
Hall, Kimbark & Co., Chicago, Illinois. Commended.

Alarm Lock, "Deckrow's Patent:"
Wallace Smith, Chicago, Illinois. Very highly commended.

Belt Coupling:
Samuel Meltzler, Naperville, Illinois. Commended.

Portable Gas Generating Apparatus:
A. K. Tupper, Pontiac, Michigan. Very highly commended.

Four Filterers:
A. R. & G. H. Miller, Chicago, Illinois. Commended.

Agricultural Cauldron and Steamer:
D. R. Prindle, East Bethany, New York. Commended.

Meat Cutter:
H. W. Austin, Chicago, Illinois. Commended.

Lot Scales:
H. W. Austin, Chicago, Illinois. Commended.

Two Druggist Scales:
S. S. Hitchcock, Chicago, Illinois. Commended.

Four Platform Scales:
S. S. Hitchcock, Chicago, Illinois. Commended.

One Six-Ton Hay Scale:
S. S. Hitchcock, Chicago, Illinois. Commended.

Three Trucks:
S. S. Hitchcock, Chicago, Illinois. Commended.

Hay Scale—Ten Tons:
S. S. Hitchcock, Chicago, Illinois. Highly commended.

Air Gun:
J. H. Morse, Peoria, Illinois. Commended.

Combination Lock:
J. H. Morse, Peoria, Illinois. Commended.

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Two McGreggor Ventilating and Gass-burning Stoves:
H. C. Van Schaick, Chicago, Illinois. Commended.

Mangle Machine:
Lange, Brown & Co., Chicago, Illinois. Commended.

Universal Wringer:
Metropolitan Washing Machine Company, Middlefield, Connecticut. Commended.

Washing, Wringing and Starching Machine:
James B. Rice, Aurora, Illinois. Highly commended.

Two Rocking Horses:
James B. Thomas, Chicago, Illinois. Highly commended.

Three Boys' Hand Sleds:
James B. Thomas, Chicago, Illinois. Commended.

Six Children's Wagons:
James B. Thomas, Chicago, Illinois. Commended.

One Broom:
T. R. Pearson, Morrison, Illinois. Commended.

Twelve Brooms:
A. D. Ferry, Chicago, Illinois. Highly commended.

Patent Automatic Fan and Fly Brush:
William Carpenter, Peoria, Illinois. Very highly commended.

Model for Improved Shop Bin or Substitute for Drawers:
S. R. Shultz, Princeton, Illinois. Very highly commended.

Trotting Sulkey:
Joseph Hedman, Plano, Illinois. Highly commended.

Step Ladder Chairs:
E. K. W. Blake, Chicago, Illinois. Highly commended.

Model of Bedstead with Musketo Bar:
E. K. W. Blake, Chicago, Illinois. Commended.

Bosom Ironing Board:
E. K. W. Blake, Chicago, Illinois. Commended.

Bread Board:
E. K. W. Blake, Chicago, Illinois. Highly commended.

Shirt Board:
E. K. W. Blake, Chicago, Illinois. Highly commended.

Step Ladder:
E. K. W. Blake, Chicago, Illinois. Highly commended.

Light Trotting Buggy:
H. Willets, Chicago, Illinois. Highly commended.

Specimen of Ivory Turning:
George J. Williams.

Display of Leather:
Blackburn & Brothers, Chicago, Illinois. Highly commended.

Dr. Bull's Excelsior Liniment:
Charles Bull, Chicago, Illinois. Commended.

Sixty varieties of Willow Ware:
C. Bull.

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One Pistol and Holster Block:
S. A. Minor, Chicago, Illinois. High commendation.

Best Glue:
Turner & Young, Chicago, Illinois.

Best Neats-foot Oil:
Turner & Young, Chicago, Illinois. Highly commended.

Cement Roofing:
Johns & Crosby, New York City. Highly commended.

One Case Dr. W. W. Allport's Dentrifice, by himself:
E. H. Sargent, Chicago, Illinois. Commended.

Sample Ox Bows:
O. W. Clark, Appleton, Wisconsin. Highly commended.

Sample Cologne Spirits:
A. T. Crosky, Chicago, Illinois. Highly commended.

Sample of Alcohol:
A. T. Crosky, Chicago, Illinois. Commended.

Model of a Still:
A. T. Crosky, Chicago, Illinois. Commended.

Specimen of Window Sash:
C. T. Boggs, Chicago, Illinois. Highly commended.

Chess, Checker and Backgammon Board:
Elias Suttle, Belvidere, Illinois. Commended.

Specimen of Plain and Fancy Book Binding:
Cyrus J. Ward, Chicago, Illinois. Commended.

Portable Fence:
D. R. Prindle, East Bethany, New York. Commended.

Model of Joiner's Bench:
Wm. Linton, Chicago, Illinois. Commended.

Two Rolls Rubber Belting, Two Rolls Leather Belting, Two Rolls Rubber Hose and other Rubber Goods:
John B. Ideson, Chicago, Illinois. Highly commended.

Five Gallon Can of Paint:
S. S. Hitchcock, Chicago, Illinois. Highly commended.

CLASS G.

Nutmeg Muskmelon:
Gage Brothers & Drake, Chicago, Illinois. Commended.

Sample of Malt:
J. S. Saberton, Chicago, Illinois. Commended.

One Bale of Hops:
H. B. & A. M. Lewis, Chicago, Illinois. Very highly commended.

Best Bale of Hay:
William Butts, Jefferson, Illinois. Highly commended.

Best Collection of Pickled Vegetables:
Charles Kohler & Co., Chicago, Illinois. Commended.

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Chinese Cane Sirup:
Justin Rogers, Elkhorn Grove, Illinois. Commended.

Sample Sugar Cane Sirup:
J. C. Plumb, Madison, Wisconsin. Commended.

Uncle Sam's Pop:
Samuel Vale, Chicago, Illinois. Highly commended.

CLASS H.

Best Cotton Tree:
Joseph Creole, Chicago, Illinois. Highly commended.

Variety of Grapes, viz: Black, Hamburg, White Chaselas, Wilmot, Hamburg, etc.:
Gage Brothers & Drake, Chicago Illinois. Very highly commended.

Display Delaware Grapes:
William Cutler, Beverly, Illinois. Very highly commended.

Two varieties of Apples:
A. Bainbridge, Cobden, Illinois. Highly commended.

Catawba Grapes:
A. Bainbridge, Cobden, Illinois. Very highly commended.

Two varieties of Pears:
A. Bainbridge, Cobden, Illinois. Very highly commended.

Best White Heath Peaches:
A. Bainbridge, Cobden, Illinois. Very highly commended.

Best Variety of Peaches without name:
A. Bainbridge, Cobden, Illinois. Very highly commended.

Collection Catawba Grapes:
W. R. Aller, Cobden, Illinois. Highly commended.

Collection Apples from Wisconsin:
J. C. Plumb, Madison, Wisconsin. Very highly commended.

Six varieties Plums:
J. C. Plumb, Madison Wisconsin. Highly commended.

Four varieties of Pears:
J. C. Plumb, Madison, Wisconsin. Highly commended.

Best Collection Peaches in variety:
Newhall & Clark, South Pass, Illinois. Highly commended.

Apple Jelly:
Mrs. L. G. Schenck, Libertyville, Illinois. Highly commended.

Raspberry Jelly:
Mrs. N. P. Iglehart, Chicago, Illinois. Commended.

Best Present Use Ale:
A. P. Dickinson, Chicago, Illinois. Commended.

Four Bottles of Tomato Wine, for Medicinal Purposes:
Dr. E. F. Garvin, Chicago, Illinois. Commended.

One Bottle Sparkling Catawba:
American Wine Company.

Catawba of 1857:
Charles Carpenter, Kelly's Island, Ohio. Very highly commended.

Four Bottles of Catawba of 1858:
Charles Carpenter, Kelly's Island. Ohio. Commended.

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Isabella Wine, vintage 1858:
Charles Carpenter, Kelly's Island, Ohio. Commended.

Hollyhocks:
J. C. Ure. Highly commended.

One Rustic Seat:
John O. Fuller, Evanston, Illinois. Highly commended.

Winter Bouquets:
W. S. Steel, Evanston, Illinois. Highly commended.

CLASS I.

Five Snare Drums:
G. D. Foster, Chicago, Illinois. Highly commended.

Lot Daguerreotypes:
C. W. Florence, Chicago, Illinois. Highly commended.

Specimens of Fresco Painting:
Jeone & Almini, Chicago, Illinois.

Two Landscapes in Water Colors:
E. Whitefield, Chicago, Illinois. Highly commended.

Marble Mantles:
J. E. Cassidy, Chicago, Illinois. Highly commended.

One Book Stencil Samples:
P. B. Green, Chicago, Illinois. Highly commended.

Series Commercial Text Books:
Bryant & Stratton, Chicago, Illinois. Highly commended.

Paintings and Gildings on Glass:
Otto Stietz, Chicago, Illinois.

System of Book-keeping:
Bryant & Stratton, Chicago, Illinois. Highly commended.

Best Specimens of Printing:
Thompson & Day, Chicago, Illinois. Highly commended.

Best Carving in Ivory:
A. W. Escherick, Chicago, Illinois. Very highly commended.

Specimen of Printing:
Beach & Barnard, Chicago, Illinois. Highly commended.

Two Water Color Paintings, Figures:
E. Whitefield, Chicago, Illinois. Highly commended.

CLASS K.

Display of Furs:
Thomas B. Morris & Co., Chicago, Illinois. Commended.

Cotton Batting:
Mosser & Brother, Chicago, Illinois. Commended.

One Box Silk Ribbon:
Cheney Bros., Hartford, Connecticut.

Six Pieces Pongee Handkerchiefs:
Cheney Bros., Hartford, Connecticut. Commended.

One and One-half Pounds Machine Silk Twist:
Cheney Bros., Hartford, Connecticut. Commended.

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REPORTS OF COMMITTEES FOR FAIR OF 1861.

REPORT OF COMMITTEE ON LOT 34, CLASS F.

To the Secretary of the Illinois State Agricultural Society:

DEAR SIR:—The undersigned, Chairman of the Committee on Lot No. 34, Class F, Agricultural Implements, at your last State Fair at Chicago, begs leave to present some of the difficulties under which the Committee labored in their examinations:

First. They were not placed on duty until the afternoon of the fifth day of the Fair.

Second. The range of Implements embraced more than one Committee could examine properly without two days' full employment—one day being as long a time as should reasonably be expected from parties visiting the Fair with the view of enjoying all its benefits.

Third. The grounds for the trial of plows and other implements requiring field tests, were not officially made known to the Committee at any time; and when found, through the exertions of some of the exhibitors, they were inappropriate, and too remote (two miles) from the Grounds, especially as no means of conveyance were provided for the Committee to reach them, although promised when demanded.

Fourth. Four or five Implements, entered and competing for the $100 premium, as new and valuable, required a full and extended trial in the field to test their several claims of merit. No opportunity whatever was afforded for such a test after the books of entry were placed in my hands, although the parties exhibiting had been in readiness for two days previous, when it might have been done. On the promise of suitable vehicles for the weather, for the conveyance of the Committee to the grounds on the afternoon of the second Monday of the Fair, the exhibitors were promised a trial at that time. The Implements, all of which were cumbrous, were taken to the trial-fields through mud and rain, at considerable expense for teams, etc., but the Committee could not follow them for want of the promised conveyance. They occupied their time, however, in the rain, in examining and awarding premiums on all the Implements left on the Ground. After remaining on the field for some two or three hours, the exhibitors who went out returned to the Fair Grounds about 5 P. M., greatly chagrined and considerably angered at the neglect of *some one*, and finding no officer on the ground on whom to vent their feelings, the Committee were compelled to receive their freely outspoken indignation. Properly

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managed, all this, I think, could have been avoided and an award made. Under the circumstances, *no award could be made* that would have done justice to all parties concerned—hence *none was made.*

A SUGGESTION.—It is sufficient for one Committee to examine and test the plows alone; another the drills, seed-sowers and corn-planters; another the cultivators, harrows, rakes, etc., and no premiums should be awarded on either without a field test. Placing too great tasks upon Committees is a fruitful source of dissatisfaction to all parties interested, and tends more towards throwing distrust, if not contempt, upon any Society's awards, than perhaps any other one thing in the management of Fairs.

Respectfully submitted.

WM. DUANE WILSON,
of Des Moines, Iowa.

REPORT OF THE COMMITTEE ON CLASS L, NATURAL HISTORY.

To the Illinois State Agricultural Society:

OFFICERS AND MEMBERS: Your Committee, to whom was assigned the duty of examining collections of specimens exhibited at the late State Fair, in the Department of Natural History, Class L, under the superintendence of R. H. Holder, Esq., and of awarding premiums, would hereby submit their report:

As only two members of the Awarding Committee originally appointed for Lot 54, and no member of that appointed for Lot 55, appeared at the Fair Ground, the undersigned were induced by the superintendent to stand as substitutes for the two committees, and to attempt to discharge the duties of both.

In Botany, three entries were made. Dr. Charles A. Helmuth, of Chicago, exhibited a valuable collection of five hundred species of plants, with which we were much pleased, and which we marked "worthy of high commendation." We were especially interested in a collection of twelve hundred species, including mosses, offered for exhibition, by M. S. Bebb, Esq., of Springfield. We can hardly speak in too high terms of this collection. It is, in itself, a monument of praise to the industry, scientific accuracy and artistic skill of the exhibitor. The specimens examined by us were generally very perfect, exhibiting often, with great taste and accuracy, the different parts of a given species at successive stages of its growth, presenting root, stem, leaf, flower and fruit, and preserving with great success the natural colors and appearance of the plants. The portion of this collection included in the order of *compositæ*, was very valuable. In pressing, preserving and arranging specimens for exhibition, Mr. Bebb has no superior. We recommend that a special premium be voted him by the Society.

Dr. George Vasey, of Ringwood, exhibited 1360 specimens of Illinois plants, in which mosses were included. The specimens in

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this collection were generally good, well preserved and carefully labelled. They were systematically arranged, each specimen in its proper place, according to its order and genus. This collection includes 160 plants more than any other presented, and seems to be, on the whole, the "*best collection illustrating the botany of Illinois.*" We have, therefore, awarded to the exhibitor the Society's premium of seventy-five dollars.

In the division of Geology, two collections were exhibited. A. H. Worthen, Esq., of Springfield, presented 900 species of fossils, many of the specimens very fine, affording rich illustrations of the organic remains found in the earth within the boundaries of our State. Included in this collection were 75 species of plants, 38 of corals, 300 of encrinites, from 400 to 500 of shells, and 100 specimens exhibiting fish remains. All were scientifically classified and arranged. As a paleontological collection, this contribution is, in our opinion, *deserving* of a first class premium; but the specimens seemed to your Committee to be too exclusively confined to one department of Geology to be entitled to the premium offered by you.

Prof. J. H. McChesney exhibited a collection less valuable in some respects, than the above mentioned, but illustrating very fully the entire Geology of the State, presenting specimens of the mineral masses which compose the earth and of the organic remains which they contain. Of rocks—including geodes and building materials—clays and soils, he presented 355 specimens; of plants, 17 species; of corals, 41; of coals, 42; and in addition, 368 other specimens, illustrating paleontology. To this exhibitor, we have awarded the Society's premium.

Of "Useful Minerals," there was but one collection presented, and that by Prof. J. H. McChesney. It consisted of 100 specimens, and 80 varieties, including iron, zinc, copper, (carbonate and native,) sulphuret of Barites, quartz, manganese and chalcedony. It seemed to your Committee worthy of your premium of fifty dollars, and they have awarded it accordingly.

Of the native woods of Illinois, one collection was presented by A. B. Bodley, Chicago. It was not without interest and value, but, in the opinion of your Committee, a collection to deserve the Society's premium, should more generally present, not only the wood, but the bark, leaf, flower and fruit of the different trees. It would be desirable that accompanying cards should give the common and specific names, and locate the place of growth of every specimen.

In Ornithology, two collections were entered. That presented by R. H. Holder, Esq., of Bloomington, is regarded by the Committee as especially valuable in a scientific point of view. It embraces 147 species included in 20 genera. The aim of the exhibitor has evidently been, not to multiply and arrange showy specimens for cabinet display or for sale, but to collect and preserve, for

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the advancement of a most interesting department of Natural Science, the full number of species belonging to every genus of birds found in the State, and to place all on exhibition, according to their orders, families and genera. And this effort has been so far successful as to *deserve*, in our view, the highest commendation, and a premium equal to any offered by the Society; but your Committee have felt that your premium should be awarded to a larger collection, placed on exhibition by F. Kaempfer, of Chicago. This exhibitor, who is a professional Taxidermist, presented 226 specimens and 169 different species. All were prepared with much artistic skill, and had been kept in an excellent state of preservation. Though evidently not collected or arranged for the special encouragement of Science, yet this seemed to be, on the whole, the "*best* collection," and to entitle the exhibitor to the premium, which we have accordingly awarded.

Four collections were exhibited, illustrating the Conchology of Illinois; one from N. W. University, entered by E. A. Clifford, Evanston; another by E. R. Roe, of Bloomington; a third by Prof. J. H. McChesney, of Chicago, pronounced by the Committee worthy of "high commendation;" and the fourth by M. S. Bebb, of Springfield. The last was evidently the best, commanding the particular attention and special praise of the Committee, and the Society's premium.

In Entomology, a collection exhibited by T. G. Floyd, of Macomb, entitled the exhibitor to the "commendation" of the Society. In this department, Dr. Charles A. Helmuth, of Chicago, made a fine exhibition. His collection of Beetles is very valuable and attracted much attention. He has over 1100 species collected in Illinois, besides many fine species from other States and foreign countries. We think him entitled to "very high commendation," especially for specimens exhibited belonging to the order of Coleoptera. But by far the best collection exhibited was presented by B. D. Walsh, Esq., of Rock Island. It is hardly possible to speak in too high terms of this extensive collection of the insects of Illinois. So far as Illinois insects are concerned, it outnumbers in the order of Coleoptera, the collection of Dr. Helmuth, and is very full in all the other orders. It could only have been collected and arranged by an exercise of industry, perseverence and skill, and by an application of scientific knowledge, reflecting great honor upon the collector and entitling him to high rank among the Naturalists of the State and of the country. The Committee do not hesitate to pronounce his the "best collection illustrating the Entomology of Illinois," and unanimously award to him the premium of the Society.

Respectfully submitted.

J. B. TURNER,
J. P. WESTON,
W. H. RYDER,
I. A. LAPHAM,
Awarding Committee.

CHICAGO, *September* 16, 1861.

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WINTER MEETING OF EXECUTIVE BOARD.

JANUARY, 1862.

PREMIUMS AWARDED.

ESSAYS.

On the Cultivation of Cotton in Illinois: C. T. Chase, Chicago	$10 00
Special Premium for Essay on same: M. L. Dunlap, Champaign	10 00
On the Cultivation of Chinese and African Sugar Canes, and their Manufacture into Sirup and Sugar: E. F. Newberry, Litchfield, Montgomery county	10 00
On Preparation of Soils: J. B. Turner, Jacksonville	10 00
On Orchards in Illinois: J. T. Little, Dixon, Lee county	10 00
On Drainage: H. M. Kidder, Evanston, Cook county	10 00

The Committee on Essays on Insects Injurious to Vegetation, reported they deemed the Essays by Mr. Walsh and Mr. Thomas, very valuable, and being unable to come to a satisfactory decision as to their respective merits, recommended the award of a premium of twenty-five dollars to each.

FLELD CROPS.

A. S. Barnard, Du Page county, for the best field Wheat (Fall or Spring,) not less than five acres, the "Manny Prize," of Manny's Combined Reaper and Mower	$145 00
J. J. Woodside, Coulterville, Randolph county, White Wheat, Second best	15 00
J. J. Woodside, Coulterville, Randolph county, May Wheat (Special Premium)	10 00
S. W. Arnold, Cortland, DeKalb county, Spring Wheat, Second best	15 00
H. L. Boies, Sycamore, DeKalb county, Spring Wheat, Third best	10 00
S. W. Arnold, Indian Corn, Second best	25 00
S. W. Arnold, Oats, Second best	10 00
S. W. Arnold, Beans, First Premium	10 00
S. Wilber, Momence, Onions, First Premium	10 00

FARMS, NURSERIES, ETC.

Best improved and highly cultivated Farm of not less than 160 Acres: First Pre-

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Best arranged and cultivated Nursery of Grafted and Budded Apple Trees, 1 to 4 years old, Charles Kennicott, Sandoval, Marion county, First Premium..... 20 00
Smith G. Minkler, Specie Grove, Kendall county, Second Premium..... 10 00
Best Apple Orchard in bearing, not less than 100 trees, with names and varieties, A. S. Coe, Port Byron, Rock Island county, First Premium.....$25 00
Smith G. Minkler, Specie Grove, Kendall county, Second Premium 15 00
Best Pear Orchard of not less than one hundred Trees in bearing, Robert Douglas, Waukegan, Lake county, First Premium..... 25 00
William Yates, Tamaroa, Perry county, Second Premium..... 15 00
Best Peach Orchard in bearing, not less than one hundred Trees, A. P. Crosby, Centralia, Marion county, First Premium 25 00
William Yates, Tamaroa, Perry county, Second Premium..... 15 00
Best experiment in Underdraining, during the year, not less than 10 acres, Henry M. Kidder, Evanston, Cook county, First Premium..... 50 00
Smith G. Minkler, Specie Grove, Kendall county, Second Premium..... 10 00
Best Apple Orchard in bearing, not less than 100 Trees, with names and varieties, A. S. Coe, Port Byron, Rock Island county, First Premium..... 25 00
For the best ten pounds of Sugar, made from Chinese or African cane, (in this case African,) to John H. Smith, Quincy, Illinois..... 25 00

There were many samples on exhibition from Indiana and Ohio, which could not, under the rule of the Society, compete with the Illinois productions. Of these, ten pounds presented by Henry Cook, Mansfield, Ohio, received the highest commendation. This sample was well granulated, of light color, and free from gum, being what is known in commerce as a lively, bright-colored sugar.

For the best twenty pounds of Sugar, made on Cook's Evaporator, the Premium of one of Cook's Best Copper No. 4 Evaporators, offered by Messrs. Blymyers, Bates & Day, was awarded to Harvey R. Smith, of Quincy, Illinois.
For the best gallon of Sirup of Chinese or African cane, (in this case African,) awarded to J. H. Smith, Quincy, Illinois.....$15 00
For gallon of Sirup, made from Sugar Cane, (the species undetermined,) a special premium of $10, awarded to Samuel Hooker, Rushville, Illinois.
For the best gallon Sirup from Chinese Cane, a special premium of $10, was awarded to C. D. Roberts, Jacksonville.

Two samples of Sirup, made by Fifield & Choate, of Tiskilwa, Bureau county, Illinois, were very much admired.

Samples presented by S. W. Arnold, of Cortland, De Kalb county, Illinois; Morgan L. Lloyd, of Morris, Illinois; Lyman Meacham, DuPage county, Illinois; and others, were excellent, and it was really difficult to decide where the premium should go.

Mr. C. Cory, of Lima, Lagrange county, Indiana, presented samples of Sorghum and Maple Sugar, and Sorghum Sirup, made on his Evaporator, a model of which he exhibited. The sirups were fine, and the Maple Sugar very superior. The Sugar seemed to have been injured in granluation by the too free use of lime.

Samples of Sirup and communication from Mr. E. B. Warne-

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STATEMENTS OF FIELD CROPS, ETC.

STATEMENT OF S. W. ARNOLD.

CORN.

Statement of manner of cultivation, etc., of a field of corn raised by S. W. Arnold, of Cortland, DeKalb county, Illinois, 1861:

Land broke four years ago last spring. First three crops on the land was wheat; fourth, corn. The straw from about thirty acres of wheat was, last year, spread on the land and burned. Commenced plowing the 7th of May, with three horses; furrow not less than 10 inches. After plowing, dragged and rolled; marked very deep, the driver riding on marker; five rows at once, 3 feet 1½ inches between rows. Planted 15th and 16th of May; mostly dropped by hand, one seed in a place, 10 inches apart, and covered by rolling across the furrows. Commenced working with two horse drag, the narrow end behind, as soon as the rows could be well seen. Worked in all five times, with drag, shovel-plow and cultivator. Harvested in the usual way, the last of October.

Plowing corn ground with three horses three days, at $2 per day,	$6 00
Dragging, rolling and marking, 1½ days, at $1 50,	2 25
Planting—to six days labor at 75c,	4 50
Seed corn, five pecks,	62
Working five times—1 day, 1 horse and man each time, at $1 12½ per day,	5 62
Harvesting—to 13 days, one man at 75c	9 75
Total cost of production, exclusive of interest on investment,	$28 74

S. W. ARNOLD.

STATEMENT OF A. S. BARNARD, BLOOMINGTON, McLEAN COUNTY.

WINTER WHEAT.

The land on which the above crop was raised, was two years ago covered with a dense growth of small timber. The timber was *grubbed* up in February and March; the land plowed in June; the wheat sown September 10th, and harvested July 10th and 11th. The soil is a stiff clay, similar to the soil of all timber land through the north part of the State. It was only plowed once, and no

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other cultivation, except to harrow in the seed. The kind of wheat is what is here known as the *Mediterranean.*

Expenses of the crop:

DR.

To five days' plowing with three horses and two men,	$15 00
three days' harrowing, two horses and one man, $2 per day,	6 00
eight bushels seed wheat, at $1,	8 00
harvesting and stacking,	12 00
threshing,	15 00
marketing, (half the crop sold at home for seed,)	5 00
Total,	$61 00

CR.

By 195 bushels and 40 pounds wheat sold at 80 cents,	$156 53
Total profit,	$95 53

STATEMENT OF JOHN J. WOODSIDE, RANDOLPH COUNTY.

WINTER WHEAT.

Says: I raised a crop of white winter wheat the past season upon a certain piece of land, surveyed by J. S. Lemon; that the quantity of wheat grown thereon was one hundred and eighty-nine and one-half bushels, measured in a sealed half bushel; that he was assisted in harvesting and measuring said crop of wheat by Henry Ledbetter; that the statement annexed, subscribed by this deponent as to the manner of cultivation, expense, etc., is in all respects true to the best of his knowledge and belief; and that the sample of grain exhibited is a fair average sample of the whole crop.

JOHN J. WOODSIDE.

STATEMENT OF JOHN J. WOODSIDE, RANDOLPH COUNTY.

WINTER WHEAT.

I raised a crop of May (winter) wheat the past season, upon a certain piece of land, surveyed by J. S. Lemon; that the quantity of wheat grown thereon was one hundred and ninety-seven and one-half bushels, measured in a sealed half bushel; that he was assisted in harvesting and measuring said crop of wheat by Henry Ledbetter; that the statement annexed, subscribed by this deponent, as to the manner of cultivation, expenses, etc., is in all respects true, to the best of his knowledge and belief; and that the sample of grain exhibited is a fair average sample of the whole crop.

JOHN J. WOODSIDE.

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STATEMENT OF S. W. ARNOLD.

SPRING WHEAT.

Statement of the method of cultivation of 5 13-100 acres of spring wheat, raised by S. W. Arnold, Cortland, Illinois, season of 1861:

Ground, high, slightly rolling prairie. The present is the third crop of wheat in succession; ground broke four years last spring; plowed last October in the ordinary manner, with two horses, about six inches deep; was sown about 1st of April, with about two bushels clean seed of the China Tea variety; harrowed once, and cross harrowed once, and finally rolled with a wooden roller. No manure has ever been used on the land, except a small straw stack was burned on a few square rods.

To 2½ days' plowing, at $1 50 per day,	$4 25
1 day dragging and rolling,	1 50
sowing 38, reaping — cents per acre, $1 56,	1 94
binding and stacking,	4 00
threshing 111½ bushels at 8 cents,	8 92
cost of freight to Chicago and commission for selling, 10 cents,	11 15
2 bushels per acre, seed, 12½ bushels, at 75 cents,	9 37½
Total cost delivered in Chicago,	$41 13½

The wheat is still on hand reserved for seed, and the Committee may put what price they please upon it, having reference to Chicago price current.

S. W. ARNOLD.

STATEMENT OF HENRY S. BOIES, SYCAMORE, DEKALB COUNTY.

SPRING WHEAT.

Statement in regard to Spring Wheat:

The land upon which this crop was raised, was well manured in the spring of the previous year with barn-yard manure, and mostly planted to potatoes, of which a good crop was raised, and, as the digging of the potatoes left the land in the fall in fine order, it was not plowed at all for this crop; but, on the 25th day of March, I sowed ten bushels of Java wheat upon it broadcast. The ground at this time was thawed out only about three inches deep, but was dry at the surface

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crop of our county to about one-half the average (I hardly know exactly what,) affected this to a considerable extent, leaving, however, a very good profit for a year of failure of crops, as will be seen by the annexed statement, which I take from my account book:

FIELD NO. 2—SPRING WHEAT.

DR.	
To 1⅛ days' work of man, and 1 days' work of team, sowing and dragging	$2 13
10 bushels seed wheat, 80 cts	8 00
Reaping 5⅓ acres at 75 cents	4 13
Binding, 4¼ days	4 16
Setting up, 1¼ days	1 43
Stacking	2 80
Threshing	13 00
	$35 65

CR.	
By 130 bushels No. 1 wheat on hand now, worth 60 cents	$78 00
	35 65
Net profit	$42 35

130 bushels, divided by 5 47-100 acres, makes 23 76-100 bushels per acre.

H. L. BOIES.

STATEMENT OF S. WILBER.

ONIONS.

MOMENCE, KANKAKEE COUNTY, ILLINOIS,
December 1, 1861.

To the Corresponding Secretary of the State Agricultural Society:

I hereby respectfully submit to you a statement of the one-fourth acre of Field Onions, the crop which I entered for premium at the Ninth Agricultural Annual Fair, held at Chicago, Illinois:

The yield from the one-fourth acre was 175½ bushels, at the rate of 702 bushels to the acre; soil black, sandy loam, rather inclined to moisture; had been cultivated in onions for six consecutive years, and well manured each year except one. This year applied ten loads of well rotted manure, after plowing; evenly spread and harrowed in. Quantity of seed, one pound; variety, Danvers Yellow; sowed May 9th, with hand-drill in rows 14 inches apart. Harvested September 23d; I raised them for seed; price estimated at fifty cents per bushel; account of expenses carefully kept; and the following is my statement:

DR.		
To 10 loads manure at 15 cents	$1 50	
1 pound seed	1 00	
Plowing and rolling	75	
12 days' labor, cultivating, etc., 75 cents	9 00	
4½ days' harvesting at 75 cents	3 38	
		$15 63

CR.	
By 175½ bushels at 50 cents	$87 75
Net profit	$72 12

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I raised one-fourth acre of the Red Onion contiguous to the other, which yielded only 153 bushels. I sowed, this year, one-half pound less seed than last, and raised larger onions, but about the same number of bushels. My manure cost only the hauling—about 15 cents per load. The crop was measured in a sealed half-bushel.

SLOCUM WILBER.

STATEMENT OF S. W. ARNOLD.

OATS.

Statement of manner of cultivation of a field of oats raised by S. W. Arnold, of Cortland, DeKalb county, Illinois, in 1861:

Land broke four years ago last spring; first crop wheat, second corn, third wheat, fourth oats. Manner and time of plowing, dragging and rolling, about the same as the statement for spring wheat; quantity of seed, between four and five bushels per acre, (not measured exactly;) sown with Cahoon's Broadcast Hand-sower, the 29th day of April, 1861.

Plowing, 5 days at $1 50	$7 50
Dragging and rolling, 2 days	3 00
Sowing, 50 cents; seed at 80 cents per bushel, about $3 60	4 10
Reaping, 62½ cents per acre	6 45
Binding and stacking	8 28
Threshing	13 44
Cost of production	$42 77

Crop on hand worth very little to sell; Committee can value it as they please; cost of carriage to Chicago and commission for selling, about six cents per bushel.

S. W. ARNOLD.

STATEMENT OF S. W. ARNOLD.

BEANS.

Statement of the manner of cultivation, etc., of a field of Beans, raised by S. W. Arnold, of Cortland, DeKalb county, Illinois, in 1861:

Ground occupied last year by water melons, which were slightly manured in the hill with hog and cow manure; ground broke five years ago last spring; ground rather low, but not at all wet; plowed in common way, 27th May; dragged alternately several times; marked out with horses; rows 15 inches apart; planted 28th of May; 15 inches apart between hills, four beans in a hill, and covered with hoe; dressed out twice with hoe, and harvested in September; yield thirteen bushels nineteen pounds.

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Plowing, dragging, rolling and marking, ½ day	$ 75
Planting, to 2 days, at 75 cents	1 50
2½ pecks beans at $1 per bushel	62
Pulling and stacking, 2 days	1 50
Threshing, 1 day	75
Total cost of production	$5 12
Mostly sold in Chicago at $1 25 per bushel, freight and commission, 10 cents	$1 15
	$15 83

S. W. ARNOLD.

MANUFACTURE OF SUGAR AND SIRUP.

STATEMENT OF J. H. SMITH, OF QUINCY, ILLINOIS.

The little experience which I have had for the last few years, in the culture of the soil and manufacturing sirup and sugar from the Chinese and African canes, has been fraught with much interest and encouragement.

The farming community in our district have generally expressed full satisfaction for the munificent returns for their labors.

Not less than six thousand barrels of good sirup have been manufactured in Adams county this season; while in fact our implements were of the rudest material, and unfit to make good experiments. Hereafter we shall spare no means for a proper outfit. We have used the Cincinnati Crusher and Cook's Evaporating Pan, No. 3; and a long pan put in connection with this, say 2½ feet wide and 20 feet long, the bottom being of copper, or galvanized iron, has produced far the best and most economical results in our experience, making 250 to 375 gallons per day, with one cord of wood. We use the evaporator until the juice is thoroughly clarified and no white, gluey scum making its appearance, and that disappears at about 20 deg. to 25 deg. Beaume; then it passes gradually into the long pan, which is also under a concentrated boil, running itself down to the end of the long pan, and as it reaches 35 deg. to 37 deg. Beaume, the gate is opened into a large flat cooler that will hold the labor of the day. Frequently stirring it through the day, the next morning you will find a considerable granulation, if from the African cane, similar to the specimens in the bottle now presented for your consideration, in sirup and sugar, and without the aid of any chemical agent, and nothing but skimmer and fire. The sulphite of lime will extract all the acid from the sugar, if a solution of it

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is mingled with the juice while in the process of cleansing. We have by this process made about one ton of sugar this season, from the African cane. This specimen of sirup is from the Chinese cane, without the use of anything but the skimmer and fire. Our climate has proved beyond a doubt that we have in these Chinese and African plants, a staple production, which is natural to our soil, and will be one of our greatest commodities of commercial exchange.

Upon the soil, the opinion has been prevalent, *the richer the soil the better the cane*, but that is a losing mistake; for the more luxuriant and rank the cane, the more spongy and woody fibres in the stalk; and although it yields more juice to the acre, it will run only 5 to 7 deg. Beaume, while a smaller growth, on weaker land, will run from 10 to 12 deg. Beaume. The Chinese cane, when raised on sandy soil, gives a most beautiful flavored sirup, and is more desirable for sirup than any of the Imphee kinds, as there is much more acid in the African canes. We have met with several varieties of the African, but find in our experiments only three that are adapted to our climate and soil. The remainder, the seasons are too short for ripening. The Neeaza-na Boombwa-na and Oomse-a-na—these will ripen in ninety days, and our yield has been 1200 pounds of sugar, and 125 to 200 gallons of sirup to the acre.

We find no trouble from these canes to make sugars, and had we the implements for a refining process, or had we been permitted to take our sugar to the Chicago refinery, our specimens would have equaled Belcher's best white crushed. You can take all acid taste from the Imphee cane with a small solution of sulphite of lime.

We find also that the season has much to do with the saccharine richness of the cane. A dry season has proved much the most favorable, and in fact these are the most hardy plants of all our farming vegetation, and a severe drouth is greatly to their advantage. A high, rolling, sandy soil, we have succeeded the best with; not but these plants will give a good return on any soil, even on the flat meadow land, and will improve the land wherever they grow.

Planting.—This should be as early as convenient, the seed being soaked about two hours in a weak solution of chloride of lime, (say one ounce to one pint of seed). Every day gained will be so much done in the manufacturing before frost. If you plant radish seed with the cane, they are up soon, and will guide you in early cultivating your crop. We have lost much in covering too deep: cover very lightly. The seed, if covered deep, will rot. We use no manure, unless it may be vegetable, and by this means we have been able to work our crop by the last of August or first of September.

Some portions of your field may be fit to work earlier than other portions. You may determine this by cutting at different points and expressing the juice, and it will vary from five to ten degrees, Beaume. We believe the Chinese cane, if planted year after year, without change of seed, will naturally run to broom corn, even if

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there is none near it to hybridize from, and we know that the African and Chinese do hybridize from each other, but we have not made the experiment exulusively to know the result. We plant four feet one way and twelve inches the other, north and south. The African cane stands the winds of our prairies much better than Chinese, because it does not grow so tall, and has a much thicker stalk. Cane that is broken or bent, or scarred in any way, is unfit for sugar or sirup, because the wound sours the juice, and gives the sirup a dark color. The seed will become a very important item in this crop. There are not less than twenty-five to thirty bushels to the acre, and it is worth more than corn for horses, hogs, or any kind of stock, and makes as good a cake as the buckwheat. We have fatted hogs exclusively with the cane seed, and as good pork as any we ever had.

If you sow oats and mix the cane seed, you can harvest your oats and have a fine grass pasture all the season for stock, and the cow that is fed upon it will give an increased quantity of milk.

When you begin to manufacture your crop, strip the leaves, cut the cane, and express the juice all on the same day, if you would avoid the souring or fermenting of the juice, (which commences as soon as the cane is cut,) otherwise you will destroy the flavor of the sirup. From fermented juice the acid is hard to remove; but a natural acid can be remedied. There is naturally in the leaf a bitter sap, which will produce bitter sirup, and this has been called by most people, scorched sirup. Now, when the leaf is removed, it causes a wound and this bitter sap runs to the stalk, if it stands any time after stripping. Yet, this is much more perceptible when the frost strikes the leaf. Then you have what is called scorched sirup all the time. If the weather is cool, I would advise the cane to be cut and shocked before the frost touches it.

We have referred to the refining process. The Chicago refinery, we have but little doubt, will have all it can do another season to refine our sirup and sugar. Why not? Our sugar has as good a body, and as firm a crystalization, as any of the Southern. All sugars have to be purged from the molasses; and I remember well when our Southern sugars were as moist and heavy as the specimens before you. Our draining process has been rather a forced one, and we have pressed the sirup from the sugar through fine bale-cloth. Last week these specimens were in the sirup. We have not used a draining room, which should be kept at a temperature of about ninety degrees Fahrenheit. The African sirup kept in such a room will produce seven-tenths sugar.

January 2, 1862.

Mr. S. states the cost of production of sugar five cents per pound, sirup twenty-five cents per gallon.

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STATEMENT OF HENRY COOK, OF MANSFIELD, OHIO.

The sample of sugar (10 lbs.,) accompanying the following statement, was the best article on exhibition, and received the highest commendation of the Executive Committee—being produced out of this State, it could not compete for the premium.

To the Members of the Board of the Illinois State Agricultural Society:

GENTLEMEN: In response to the liberal offer of your Society for the best samples of Sorghum sugar, I send herewith ten pounds of my crop of 1861, together with a sample of several barrels of my molasses. My process of cultivating and manufacturing the sorgho plant is as follows:

I sprouted my seed by putting it into warm water, and letting it stand twenty-four hours by my stove. On the 7th of May, I planted it in a piece of gravelly upland, soil rather poor and had been planted in cane the two preceding years. My cane stood about three feet apart one way and two and a half the other. I began to work it as soon as I could see the cane, and kept the ground clean and well stirred until the cane was about three feet high. I allowed the suckers to grow with the rest. About the first of October the seed began to ripen, but not over half the cane matured before I cut it up, for fear of frost. I shocked it, and allowed a circulation of air through it by banding around the tops instead of the middles. After standing a few days, I hauled it into the barn and stripped and topped it, as my time was so taken with my neighbors' cane I could not work my own, but when I worked it I found that the exposure to the sun while in shock had brought on fermentation and materially injured my prospects for the ton or two of sugar I had intended making. As an experiment, I selected the gallows stalks, or breaks of my shocks, pressed them out and boiled the juice on the Cook Evaporator, and set the sirup in a warm place, in an open shallow vessel—the temperature about 80 deg. F. The result was crystalization in twenty-four hours. I used no defecating agents except *heat and the skimmer*. The sirup weighed eleven pounds to the gallon. When thoroughly crystalized, I drained it by pressing out the molasses. My mode of doing this is to pour the crystalized mass into a strong bag of coarse linen, and put it under any press which may be convenient. A short time is sufficient to press it dry. The sugar should be warm when put into press. I prefer this to any other mode of draining, because of its speed and thoroughness.

My deductions from four years' experiments are, that sorghum sugar can be made with certainty and profit; that the cane should ripen in the field if possible; that when the juice has attained its maximum of sugar the cane should be cut and worked as rapidly as possible; that such portions of the cane as cannot be immediately worked should be sheltered from the sun and weather.

There is a gum in the cane juice which must be removed before

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crystalization and drainage can be accomplished. I have never succeeded in removing this in ordinary pans and kettles, or by the use of chemicals. The juice must be subjected to different degrees of heat, running from a low to a very high degree, and means afforded of removing the impurities while subjected to this heat, lest having once been liberated from the juice, they may, by continued boiling, become re-incorporated. This process eventually liberates the gum so that it may be removed with the skimmer.

HENRY COOK.

STATEMENT OF GEO. J. MAXWELL, LEXINGTON, OHIO.

[The specimen of sugar presented by Mr. M. is the lightest colored sample on exhibition, at the late meeting. It is indeed a very beautiful article.]

The accompanying sample of sugar is forwarded as a specimen of my manufacture from this fall's crop. My mode of cultivation and manufacture is as follows:

I selected a mellow piece of land which had been in broom corn the year before, plowed it deeply, and on the 20th of May, drilled my seed in rows about three feet apart. When the cane came up, I thinned out to about eight or ten inches. The soil was of a warm, somewhat gravelly nature, with a trace of lime in its composition. I kept it freely stirred, hoeing my cane four times and cleaning out the weeds thoroughly. At the last hoeing the cane was about breast high. Part of the cane was suckered, but in working up the cane I could not perceive that I had gained anything by it, as the suckers left all matured, and were as rich in juice as the main stalks.

By the last week in September, the seed had ripened, but I was not prepared to work it for some eight or ten days afterward, at which time the lower three joints were quite yellow, showing its thorough ripeness. About the propriety of allowing it to stand so long, (when there is no danger of frost,) I can express no opinion.

When hauled to the mill I topped it, cut the canes in the middle, and boiled the juice of the butts by itself, on one of Cook's evaporators, without the use of any foreign substances for defecation. On setting the sirup (which was never barreled at all) into a warm place, it crystalized in forty-eight hours. The sample of sugar sent you

STATEMENT OF MR. WARNER, OF MORRISON, ILLINOIS.

MORRISON, WHITESIDE COUNTY, ILLINOIS,
January 6, 1862.

DEAR SIR: Being unable to attend the meeting of agriculturists to be holden in Springfield, on the 7th inst., I submit the following items pertaining to sugar and sirup, for the year A. D. 1861. On or about December 25th last, I forwarded circulars to seventy-two persons in this county, reported to be engaged in the manufacture of sorghum sweets, propounding certain questions relative to the culture and manufacture thereof. Up to the present time I have received answers from twenty of the number, from which I gather the following facts:

Of the twenty reported, twelve have iron and eight wooden mills.

The total number of gallons of sirup made is 12,996.

The greatest number of gallons of sirup made by one person is 1,500.

The least number of gallons made by one person is 100.

There was no sugar made equal to ordinary New Orleans, unless in very small quantities.

Seventeen of the number do not deem clarifying materials essential to the manufacture of sirup ordinarily, one of the number does deem clarifying essential, and two are silent upon the subject.

The averaged number of gallons of juice boiled into one of sirup is 7 9-10.

Ten of the number are in favor of the African cane for general cultivation, two are in favor of the African cane for general cultivation, two are in favor of the Chinese cane, and eight had not yet sufficient experience to decide.

Seventeen of the number pronounce in favor of a *rich, sandy soil* for the culture of both the African and Chinese cane, one in favor of a well drained clay soil, and two are silent in the matter.

The greatest average number of gallons of sirup per acre in any one vicinity is 225, the least 80, and the average 142 6-10.

The greatest cost per gallon of sirup, as established by any one manufacturer, is fifty cents, the least twenty cents, and the average thirty-one cents.

Taking the twenty persons engaged in the manufacture of sirup as a standard of the whole number of seventy-two persons in

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cane seed, in the spring of 1860, was, by carelessness, intermixed with a small quantity of broom corn seed. The effect, in the fall of 1860, was hardly perceptible, but in the fall of 1861, it proved disastrous in the extreme, the juice from the mill indicating only two degrees on the saccharometer, and producing *dark, strong and bitter* sirup, scarcely worth anything.

The sample marked "B," is the average of fifteen different parcels, made from different cane at one mill. The richest juice expressed at that mill, marked seven and a half, while the average was about five degrees on the saccharometer.

The sample "C," is the entire barrel of sirup in the act of granulation; made from Chinese sugar cane. There are quite a number of barrels over the county in a similar condition.

The sample "D," taken from a barrel of sirup, forty per cent. of which had granulated, made also from Chinese sugar cane.

The sample "E," is made from the Chinese sugar cane, a common article.

No clarifying materials were used in any of these samples. I very much regret my inability to furnish you with some samples, made from the African cane, the sirup of which is very nice. I have not yet received the samples promised.

From my own, and knowledge derived from others, I am satisfied the African cane contains but little of that *acid*, so abundant in the Chinese cane, and the same number of pounds of cane is richer and produces more crystalizable matter. Of the twenty sugar growers hereinbefore reported, it will be seen a large majority are in favor of the African cane for general cultivation. But I think when we shall be masters of the art, *to neutralize the acid*, so prevalent in the Chinese, we shall think more of it than we do now. I have no doubt its yield of sirup per acre, is more than the African, as a general thing.

This county has produced more sirup this season, *by one-half* at least, than was ever brought into it in any one year. Many families have almost entirely dispensed with the use of sugar. Next season this county will doubtless become an exporter of sirup, to a great extent. And, shall the people of this State be so fortunate as to possess themselves of the proper methods of clarifying and granulating the sorghum sweets, there is no good reason why the State of Illinois cannot be an exporter of sugar and sirup for the next twenty-five years, at *less prices* than she has imported them at for the same period.

Yours, truly,

ED. B. WARNER.

STATEMENT OF GEORGE H. PAGE, DIXON, LEE COUNTY.

Through the request of President Van Epps, we herewith submit, briefly, our views and experience in regard to the culture and manufacture of the Sorghum, together with a sample of Sirup:

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We choose to plant as early as corn can possibly be planted, on dry land, three and a half feet each way. There is economy in cultivating it both ways. Think it best, to *make sure* of a good stand, to put double the seed in a hill that you wish to grow there; then thin out to four stalks. If grown any thicker than that, there is greater danger (being slimmer stalks) of lodging by wind, and costing every thing to strip it. We hoe once, the first thing, as soon as out of the ground; then cultivate like corn.

We prefer to have the seed nearly all black, before cutting, but would cut almost any time before that, rather than have it frost-bitten. It will do no harm at all to strip two or three weeks before cutting, to facilitate gathering a large crop. *Bind it by all means;* it pays in handling, as evidently as it does to bind wheat. Our neighbors all agree to this, after trying both ways. Use osier willow or any thing most convenient.

If there is any one thing that we *positively know*, it is, that it may be kept and worked, with equally good or better success, two and three months after cutting, (that is *for sirup*, in making sugar we have no experience.) It evaporates some in the stalk by lying. None the less sirup, to speak of however. The sap is purer by the stalk hardening; and there is economy, again, in boiling sap thus made sweeter. It is reduced to sirup in less time, and of course, better.

Binding is necessary, again, in our method of putting up to keep. We pile the bundles, in square form, by crossing them; laying them four or six inches apart. In this way the air circulates readily through the pile, and thus precludes any possibility of moulding.

It needs to be dried in the field a couple of days before piling. If to be kept very long, cover the top, but leave the sides of the pile open till danger of frost; then the most convenient way is to stand shock corn up by it.

The sample submitted was made from the Chinese variety. (No experience with Imphee.) Made on Gate's pan, *eight weeks after being cut, and ten weeks after stripping.* We used nothing to cleanse, except the skimmer, while boiling. Put the cream of lime into sirup. Add this in the coolers, about one quart to a barrel. Have had no difficulty with sirup souring.

We have done something at Sorghum making for the last three years. First, only about 60 gallons on Cook's pan. Next year,

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the seed will often ripen in the north part of the State, if planted comparatively late, and it may be called *ripe* cane; but the idea is, to have it ripen during the hot weather, in order to sweeten the stalk. This looks reasonable, from the fact, that cane is known to be sweeter south than north.

We might easily write off a dozen pages, by particularizing upon the modes of securing cane, with other things, and by discussing the merits of different evaporators; but brief accounts are more frequently noticed and read with greater interest.

Dixon, Lee county, Illinois, February 22, 1862. GEORGE H. PAGE.

STATEMENT OF MESSRS. FIFIELD AND CHOATE, TISKILWA, BUREAU COUNTY.

JOHN P. REYNOLDS, ESQ., *Corresponding Secretary, Illinois State Agricultural Society:*

SIR: We planted about fifteen acres to Sorghum or Chinese Sugar Cane; but a part of the field came up so unevenly that it was not probably equal to more than thirteen acres of good cane. From this we manufactured about 1,950 gallons, or an average of about 150 gallons per acre. Besides our own, we made about 580 gallons for others; making a total of about 2,500 gallons.

In manufacturing, we used a one horse vertical cast-iron mill, made by J. P. Frost, & Co., Galesburg, and Cook's No. 3 Evaporator, set upon a brick arch. We were obliged, however, to rather crowd our mill to keep the evaporator supplied with juice; and, for that reason, used two horses on it the most of the time. The juice ran from the mill into a tub, containing a strainer of grass or hay, and was conveyed from that, through a spout, to another tub, standing over the evaporator, in the sugar house, and also containing a strainer of the same material. From this it was drawn through a faucet, or gate, into the evaporator. We used coal in boiling, keeping the hottest fire near the mouth, as we aimed to have heat enough under the front part of the evaporator to thoroughly clarify the juice by the time it reached the middle of the pan, and at the same time not to have enough back, where it had become thick, to scorch it. We aim to keep a stream, larger or smaller, running into the pan constantly, and a small one running out as much of the time as we can. From the pan the sirup is passed slowly through a cooler of (as far as I know) a somewhat novel construction, into the barrel. The cooler consists of a frame four feet four inches in hight, upon which is placed a box, or tub, with a gate, under which are arranged a series of tin spouts, fifteen in number, each about twenty inches in length, open at one end, and so placed, one under the other, that the sirup must pass through their whole united length, about twenty-five feet, before reaching the barrel; the spouts being so arranged that the pitch gradually

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increases from the first to the last, to facilitate the passage of the sirup as it becomes cooler and thicker. It is also so arranged that the pitch of all the spouts can be changed at pleasure. Under this is placed the barrel, to receive the sirup. Our other implements, except the saccharometer, gauge-rod and wantage-rod, were the common utensils of the kitchen.

We used no other cleansing agents than fire and the skimmer.

We have made no endeavors to make sugar, but have no doubt, from what we have seen, and ourselves accidentally accomplished, that it can be done, under favorable circumstances.

We have usually aimed to boil our sirup to about 36 deg. Beaume; but sometimes have run it up to 40 deg., when, by standing a short time, we found it to be quite a thick crude sugar or malada, and, when drained, made a very light straw-colored sugar, of a very fine flavor.

From a careful estimate of our expenses, for the past season, we have calculated that the actual cost of rent of land, labor, plowing, planting, cultivating, harvesting and fitting the cane for the mill, has been about fifteen cents per gallon, and the cost of manufacture about twenty cents, making the cost of production about thirty-five cents. It is but just to say, however, that owing to various causes, our expenses have been, perhaps, somewhat greater than they would be under ordinary circumstances.

We have now about a thousand gallons of sirup, which is worth from fifty to sixty cents per gallon.

December 30, 1861.

[The accompanying samples of sirup were of a light color and good flavor.]

FARMS, NURSERIES, ORCHARDS, ETC.

REPORT OF AWARDING COMMITTEE ON FARMS, NURSERIES, ORCHARDS AND DRAINING, FOR 1861.

JOHN P. REYNOLDS, ESQ., *Corresponding Secretary Illinois State Agricultural Society:*

The committee on Farms and Nurseries having made their examinations and awards, beg leave to make a detailed statement in relation thereto.

The Committee, consisting of M. L. Dunlap, William T. Hull and C. T. Chase, arranged to meet at Centralia on the 23d July, 1861, but from unavoidable circumstances, Mr. Chase could not be present, nor was he with other members of the Committee but a

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small portion of the time during their examination, but in most cases, made a subsequent visit to the several premises. In making this report, we propose to give a discursive account, merely writing out the notes taken as we progressed in our examinations.

The great range of climate of this State, running as it does, through over four hundred miles of latitude, and with a corresponding variety of soils, admonished the Committee that their task was no easy one, when it was further taken into consideration that the valleys, air currents and water sheds of the country combined to exert special influences on certain districts, aiding or retarding the hand of culture. The Fruit Hills of Egypt, looming up like a wall before the clouds that carry moisture to the basin of Egypt, by their wood-crowned summits, arrest the progress of the floating vapors, and rob them of the genial shower that is needed on the parched plains of Upper Egypt. The ammonia and other gases that the noon-day sun sends aloft from the rich bottom lands of the Ohio and Mississippi rivers, are thus deposited on these Fruit Hills, making them rich in all the elements of fertility. When the giant oaks and poplars that now tower above their summits shall give place to the orchard and the vineyard, Pomona shall then hold her court in regal splendor, amid the clusters of the vine, the blushes of the peach, the gorgeous pencilings of the apple and the pear, and the flow of the wine press. Nature has thus given to these now wood-crowned hills a climate soft and genial as that of Italy, a soil weathered down from the surrounding rocks, formed under the deep blue sea, of myriads of coral insects that give to the soil a depth of fertility that will to the end of time make that part of the State "the garden of fruits," to make glad the heart of man.

With all these gifts so profusely strewn by the hand of the Great Giver, man has done little to advance its benefits, and no one of the fruit growers of that section has had the enterprise or the ambition to compete with their brother cultivators of the more arid plains of Upper Egypt, the great stretches of prairie of Central Illinois, or the more exacting climate of the lake region. It is often the case that energy and enterprise are more than a match for natural advantages, and the skillful gardener and farmer will make up in artificial expedients what nature has denied him. And by this, those who surround the throne of Pomona, and bask in his smiles, may find themselves laggards in the van. They must be up and take their place among the ranks of men if they would maintain their position, or they will find themselves thrust aside by the energy of those of a more exacting, ungenial climate.

The Plains of Upper Egypt.—This part of the State, lying between the Big Muddy river on the south and the line of chalk-like soil extending to the neighborhood of the Terre Haute and Alton railroad, may, from its peculiar configuration, be more properly

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called the Basin of Egypt, as at no distant day it was doubtless the bed of a fresh water lake, into which the turbid water of the Missouri and the drift-wood of the Mississippi were for ages deposited, adding to the bottom of this lake an immense depth of river silt, the washing of the great lime-stone plains to the north-west. When this lake cut through the "grand chain" at Cape Girardeau, the waters were drained off; and so recent was this that little vegetable mould has been added to the general surface. The soil is of the richest material, containing all the elements of fertility of the various limestone ranges, through which flow the waters of the Missouri, admixed with the soils of the Upper Mississippi. The soil is, therefore, well adapted to general farming, and in most cases to fruit culture. The "grand chain" robs the clouds that come from the south of their moisture, and hence the *basin* is subject to long periods of drouth, and with the sun beating on the chalk-like surface, renders it of less value for pasturage; but, with deep culture and early seeding, it is valuable for the cereals. With the unequal rains, some considerable skill is required to farm it profitably, in this part of the State; but, with the richness of soil and mildness of climate, it should hold a high position not only in the cereals, but with many of the semi-tropical plants, such as cotton, castor beans, sweet potatoes, etc. Among the farmers of this section the Committee report that no one had sufficient ambition to compete for the farm premiums. At the same time the fruit growers evinced a more wide-awake disposition. Something should be done to arouse the dormant energies of the fruit-growers of the "grand chain" and the farmers of the Basin, that they may be brought into hearty competition with the other divisions of the State.

Commencement of our Labors.—Tuesday morning, the 23d, Mr. Yates found us at the hotel at Tamaroa, Washington county, and drove us to his place, which is about two miles distant to the south-west of the village. The general character of the prairie hereabouts is almost level, and the soil a light chalky one, easily dissolved in water, and in the wet season forming a perfect mortar bed, almost impassable for teams. The sight of Mr. Yates' farm rises from this level prairie in an oval form, sloping to all points, and is some twenty feet in the center above the surrounding level. In the general upheaval, this point was undoubtedly thrown thus above the plain, for the sandstone, or silicious conglomerate underlying the upper coal strata, is within twelve feet of the surface at the apex of the mound where the house is located, and the well is sunk into this sandstone some forty-five feet, where an abundant supply of water is found, from which the lime is tolerably well filtered by the sandstone. The farm contains two hundred and twenty acres, all prairie, and distant from the timber about two miles to the north and west. The site is a delightful one, from which you overlook the prairie on all sides. The prairie is but a few miles in extent,

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but contains several similar elevations, all of which are vastly better adapted to fruits, than the flat prairie, for from these miniature table lands the cold air can roll down to the lower level, and thus frost, while on these the fruit would measurably escape. The apple and most of the peach orchard occupies the north and north-east of the slope, while the dwarf pears that of the north-west. So regular is this slope that the surface water can be led either to the north or west, at the pleasure of the cultivator.

In entering the pear orchard from the east we first came to one hundred White Doyennes, fine thrifty trees, with a moderate crop of fruit; some trees quite well loaded and others with none, or but a few specimens. The next rows contain two hundred Bartlets, containing a good fair crop, many trees bending with the weight of fruit, and all making a good show. On many of the trees in the orchard we observed strips of tin, which Mr. Y. informed us was for the purpose of keeping off the crows that otherwise would destroy the fruit as fast as it ripened, but these tin strips kept them at a respectful distance, and the crop was thus saved. Twenty-five trees of the English Jargonelle were not doing well, and gave us an unfavorable impression of their value. The next in order was one hundred and sixty-five Stevens' Genessee; trees fine, but no fruit; last year they had grown a bountiful crop. The above trees had been set in the spring of 1857, of two year old trees, while the remainder of the orchard was set at the same time, of three year old trees. These latter were much the largest, apparently more than a year's difference, and we can only account for it that they were originally much better trees when taken from the nursery. The difference between first and second class dwarf pear trees is a wide one, and one that tree planters should be careful to regard. A hundred Buffams loom up like Lombardy poplars, healthy, vigorous trees, with a few specimens of fruit. This variety is not a young bearer, but will probably give a better account of itself some half a dozen years hence. Twenty-five Seckels are thrifty and contain fine specimens, though not abundant; among them we found a single specimen badly cracked, the only one that we saw in the orchard; the tree was thrifty and contained about a dozen other specimens, all fine. Twenty-five Summer Virgalieu trees, not thrifty, yet presenting quite a show of indifferent fruit. Twenty-five of B. d'Aremberg, very thrifty, with a few specimens of fruit. One hundred and twelve trees of the famous Duchess d'Angouleme, fine trees, but sparsely fruiting this seasou, last year having borne abundantly of most superb fruit, as all who visited the State Fair at Jacksonville can testify. This is Mr. Y.'s favorite variety. Ten of the B. Goubault have not done well. Seventy-two of the Beurre Brown are without fruit. One hundred and twenty-five of Beurre Diel are magnificent trees, with a moderate show of specimens. Two hundred and twenty-five of Vicar of Winkfield, good trees, with a moderate supply of pears. Forty-one of the old Summer Belle,

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with their strong shoots, are herewith greeted with pleasure for "auld lang syne." Last year the fruit of these was ripe July 4th, but at this time just ready for house ripening. This fruit should always be picked rather green and house ripened, or it will otherwise rot at the core. One hundred and fifty of the Glout Morceau, with scattering specimens, and a hundred of Fondante d'Automne, without the desired result, though fine thrifty trees. Fifty of Swan's Orange are in the same category, to which we add seventy-five Beurre d'Amalis, and twenty-five of Virgalieu, with one hundred of the La Jalva; but here comes a relief in the way of one hundred and sixty Louise Bonne de Jersey, with a superb show of melting beauties. The list closes with a hundred of the Easter Beurre, that have given evidence of more growth of tree than of fruit.

The trees are set sixteen feet each way, have not been cropped, but kept well cultivated with the one horse plow. Mr. Yates says that most of the varieties bore well last year, and that the fruit was much larger and fairer than this. Last spring nearly every tree blossomed profusely, but several severe frosts following in quick succession, the larger part of the orchard was stripped of the embryo fruit; yet it will be seen that the Bartlet and the Louise Bonne held a fair crop, while some others have a small show, but the greater number are perfectly barren. We have no doubt, that in subsequent examinations we shall find these two varieties to hold a high position as regular bearers. Mr. Yates lays the loss of a full crop to spring frost, of which he despairs of a remedy. We have before stated that the elevation is favorable to ward off this danger, and we believe that with correct culture it will produce this effect; but something more than mere plowing and planting is wanting. If the ground is saturated with moisture, and the air charged with the damp exhalations of this saturated soil, it will show no other result than that attending the low ground, as it is well known that a damp atmosphere is more dangerous in a cold night than a dry one. The inference then is, to have this table land or orchard slope so dry that the air cannot become saturated; and as it will be lighter in consequence, it will envelop the higher and dryer ground, thereby lessening the danger from frost. Underdraining is then the key to solve the mystery. But, say our friends here, "we cannot underdrain. Our soil is so constituted that it

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band the substance is a fine clay loam, which is permeable to moisture, but as most of the water is held above, it remains quite compact, unless in long continued rains. Now, if the water could be let down through this band by mole or tile drains, all the soil above it would become at once dry and friable, and this band itself soon weather down into kindly soil; at the same time the substratum would become modified, and the heat that now goes to evaporate the water would warm up the soil, and thus create an artificial atmosphere several degrees warmer than on the undrained soil, and the result would be almost certain crops, instead of, as now, accidental ones. There is no question in our mind that one-fourth of this orchard, thoroughly underdrained, would pay a better revenue than the whole of it under the best system of tillage without this improvement.

This singular formation of the clay band has not, that we are aware, excited attention beyond a few farmers, but it is certain that it is one of the most important subjects in the successful culture of fruits in this portion of the State, and will also have a material influence on the culture of winter wheat. This band, underlying as it does, a large portion of the basin, exerts a deleterious influence on it, and must, in some way, be overcome. To this end we would recommend that the Illinois Agricultural Society offer a suitable reward for the best mode of treating it, with a view to its modification. In this way a more general attention will be called to the subject, and doubtless, with good results.

It will be borne in mind that this orchard is set on the system of flat culture; had it been well ridged up, no doubt the result would have been more satisfactory. Mr. Yates cultivates his orchard four times; first from the trees, next to the trees; again from them, and last, late in the fall after the growth is completed, a heavy furrow to them, leaving a clean open dead furrow in the center to drain off the water; but with this flat culture it still leaves it flat and liable to water logging about the collar of the trees.

His crop is injured by a green worm about half an inch long, which glues a leaf to the fruit under which he eats the rind of the pear, which arrests the growth under the surface eaten, and which disfigures the fruit. There is no apparent injury to the texture of the fruit; hand picking would be a cheap and effectual remedy, but most of the mischief was done before being observed.

We would suggest, instead of so many plowings, the use of the roller and the harrow. In this soil all trees throw their roots deeply into the soil, and you can plow close to the trunk with impunity.

Peach and Apple Orchard.—The apple trees were set two rods, or thirty-three feet apart each way, and intermediate rows of peach trees set through them both ways, making the squares sixteen and a half feet. These are also cultivated with the single plow and mule, but receive less attention than the pears. The trees have been set four years. The apples have not made remarkable growth,

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from bad handling in the first place by the nurseryman—few of them have fruit. The peach trees are loaded down, and the orchard of a thousand trees will furnish several hundred bushels for market, and cannot fail of making good returns for the outlay. Of the varieties we shall speak in another place.

The Chinch Bug.—The chinch bug has become a permanent enemy and makes his annual inroads into the field crops. From the wheat stubble he attacks the corn and continues with it the remainder of the season. A constant stirring of the soil is the best remedy now known to protect the corn; he does not like to be cov- in dry dirt at all. The late Hungarian grass affords the most pleasant food for him.

The Wheat Midge.—We had hoped that we would have been spared the infliction of this pest, but it appears that we are not, for he is reported here in already uncomfortable numbers. Early sowing is the best known remedy—but then comes the Hessian fly with this early seeding. Here we have another incentive to try the early seeding and pasturing, which we have before recommended. The May, or Alabama wheat, from its earliness, has in most cases escaped them.

The yield is good, and from the best evidence that we can get, will average thirty bushels to the acre.

The Peach Grub.—Mr. Yates finds the peach grub somewhat troublesome. His remedy is to take them out with a knife in October, they are then small and to work in the bark. With a garden trowel he lays the collar of the tree bare, and with a knife takes out the young grub. The process is not a very laborious one, and should not be neglected.

The Family Medicine Chest.—The vegetable garden is the great medicine chest of the farmer, and it should be well filled with good, thrifty, well cultivated plants. No labor on the farm will pay so good a per centage as that devoted to the production of a good vegetable garden to the extent required by the family.

Manure.—On this large fruit farm no regard is had to the saving of manure, and certainly the pear and peach trees, with thorough culture, do not need it, yet the old apple orchard, now in grass, would well repay the outlay for a reasonable supply. The small fruits need it for mulching, and it would be valuable in the garden if not on the corn, but its use is, we believe, entirely overlooked.

We arrived in Centralia in the afternoon and had the pleasure to meet Mr. A. P. Crosby waiting for us with a carriage. His farm is about one and a half miles southeast of the station, on a gentle slope overlooking the village. The apple orchard which he had entered for the premium, was almost level, gently sloping to the southeast just enough for surface drainage. The trees when planted

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were three years old, and have been set six years. The culture has been of the best, otherwise there would have been no orchard, for the trees in the first place were badly grown in the nursery and worse handled, giving them a set back on transplanting that required some two years of generous care to bring them up to grade. They are now in the most thrifty condition and presenting a fair show of fruit for such a selection of varieties. The trees are set thirty-two feet apart, on a level surface, and the ordinary level culture is adopted. A crop of buckwheat is now some two inches high.

Varieties.—As we enter the orchard from the north side, we are greeted with two rows of Red June, rich in the deep red of their pomonal beauties; twenty-one of these marshaled into line, loaded with fruit now ripe, would gladden the hearts of all the school boys of the more tardy north. Twenty Rawle's Janet, with a fair crop, in their round symmetrical heads. Ten Yellow Bellflower, loaded with a heavy crop, as is its wont in this part of the State. Ten Franklin Golden Pippins, with but few specimens,—the trees are too upright, with head too high—we would re-graft it. Ten trees of that spring favorite, the Little Romanite, always to be depended upon, and always will keep good; though not of high flavor, it will continue one of the peoples' apples. Nine Newtown Pippins, with compact head and moderate growth, but here it is at home, and the crop is fair in quantity and superior in quality. Ten of the Rambo have made large growth, but even here it shows the effect of the winter. It will not do to stimulate them with high culture. They have a fair crop, notwithstanding the hard usage of the winter. Now they have commenced fruiting, their growth will be less rapid, and of course more hardy. Three trees of the Early Harvest have never fully recovered from their nursery treatment. Seven of the Summer Queen are patterns of thrift and bearing—the fruit is nearly ripe. This will be found valuable for market; it is a hardy and good growing tree, productive and strong. The orchard contains in all one hundred and ten trees, and reflects no small credit on the care and skill of its owner, whose spare hours from the active duties of the counting room, are devoted to his pomological pets.

Another Apple Orchard.—Mr. Crosby has another orchard of five hundred trees, taken from the nursery at three years old, and now two years set. This is the finest orchard of its age that we have seen anywhere. The trees were grown at the DuPage County Nursery of Messrs. Ellsworth & Co., and show that they know how to grow trees, how to lift them, and next, though not least, how to pack them for shipment. The heads are low—from two to three feet—with clean, straight trunks. Some few of the trees are in bearing. The selection of varieties, for a commercial orchard, is not the best for this point, containing too many autumn

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varieties. The early summer apples are wanted for the north, and the late keepers for the south. The trees are set twenty-six by forty feet, and are to be cropped with hoed crops for some years until in full bearing. If we are not mistaken this orchardwill prove a mine of wealth to the owner. This orchard has received far less attention than the other, from the fact that the nurseryman performed his duty. The day is not distant when planters will be more careful to whom they give orders for trees. The idea that a tree is a tree as much as a post is a post will not be tolerated, for there are live trees, dying trees and dead trees, but generally sold at the same price.

Peach Orchard.—This orchard has been set but two years, with trees but one year old from the bud. The growth of the tree is most remarkable and healthy; of course, too young to produce much fruit in this vigorous condition. The varieties are seventy-two of Coles' Early Red, which have a moderate show of specimens; the same number of Early Crawford, with a fair show of fruit; twenty-four Early York, some of which are loaded with fruit nearly ripe; ten of Hawks' Early Cling (?;) twelve Belle Shivers (?); twenty Grosse Mignonne, fruiting; twenty-four Early Royal George; fourteen Old Mixon Freestone, with a good crop; twenty-two late Crawford; twenty Alberge; eleven Stump the World; forty-three Red Cheek Melocoton; twenty Hawks' Early Red; twenty Compton's Rareripe; twenty George the Fourth; eighteen Heath Cling; thirty-six Ward's Late Free; fifty-five Druid Hill; in all, five hundred trees, probably of their age unsurpassed anywhere in the State. The aspect of the orchard is a tolerable rapid descent to the northwest, but not enough so to wash the soil in heavy rains. A crop of beans sown broadcast is on the ground. Mr. C. uses the roller to great advantage. He finds it very economical, and would not think of doing without it. The trees are set twenty feet each way.

After leaving the fruit farm of Mr. Crosby, we called to view the garden of C. A. Montross. We are promised some account of his operations, and shall pass over a further notice at this time, further than to say that if there is another garden in the State, the same size of his, equally valuable, we should like to see it.

At ten o'clock, A. M., July 24th, we reached Sandoval, and found our young friend Charles Kennicott in waiting for us. His nursery is about one mile east of the station, and adjoining the south side of O. & M. Railroad. The ground slopes gently to the south, and the long rows of trees, now full robed for summer, form an attra-

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just such as the market orchardist needs to lay the foundation of his success, and just such a selection of varieties as have been found adequate to the soil and climate of this part of the northwest. Born almost in the nursery—at all events reared in one filled with the useful and the beautiful, making it a life study, a business and a pleasure, in which good taste and training have been combined, it is no wonder that our young friend, here on the prairie slopes of Egypt, has commanded a success.

The grounds devoted to the ornamental and the small fruits cover some three acres. Among the small fruits we notice nearly the whole family of currants and raspberries; Houghton's gooseberry stands solitary as the only reliable kind in this section. About half of the nursery is budded six to fifteen inches high, and the remainder root grafts. The heads commence at two or three feet from the ground.

The rose is a great favorite here, and the cultivation is extensive and select. Evergreens make a fine growth, and are much in demand. We remained here fourteen hours for the next train, which gave us an opportunity to visit the grounds of Mr. Price, which adjoin Mr. K. on the west. Mr. P. is a farmer and a botanist, and his grounds are rich in rare hardy plants. He has done considerable underdraining, and finds in it a marked advantage. In one part of his garden on which it is difficult to grow plants, they are now the most luxuriant. The drains are put in below the band of "scald" clay before alluded to; in fact, there are several outcrops of it on his farm. In this part of the State the rains fall in torrents, and not, as at the north, in long continued gentle showers; it is, therefore, of importance to get rid of the water before the plants are drowned out, and as it cannot penetrate the band of scald clay, it must evaporate or be carried off in underdrains. Mr. P. thinks the mole plow cannot be forced through the subsoil at any season of the year, and that nothing short of the shovel and pick will be of use in putting in the tile.

At 9 o'clock, A. M., of the 25th, the conductor put us down opposite the Commercial Gardens of Messrs. Overmann & Mann, three miles west of Bloomington.

The nurseries of Messrs. Overman & Mann are located on a high swell of the prairie, overlooking a large extent of country, yet the surface of the farm is undulating, and most of the fruit trees have their long rows running down a southern slope and

but not so thick but that the sun comes through the interstices of the straw, giving just a faint appearance of sunlight, similar to that of a rather dense forest. Between these rows of posts the plant beds are made, six feet wide, and the plants, which are six to eight inches high, bedded in them, the sides are left open for a free circulation of the air. They are watered occasionally as needed, with a garden engine, by carrying the hose under the shelter and sprinkling with a rose. The heavy rains, of course, wet them thoroughly, but the cover arrests the dews and light showers. Where a large quantity are thus treated, it would be better to have a good well with an abundant supply of water, and with a force pump, send the water through India-rubber hose the distance required, say three to four hundred feet. The plants are to remain in these beds two years. The second year the cover will become thin, and they will need little more than to look after the weeds and an occasional watering. Of course, when exposed to the winds the covering of straw must be kept on by small poles or brush over it. Last spring they bedded out some seventy thousand plants, and most of them are doing well. We noted among them Black, or American Spruce, Balsam, Hemlock, Arbor Vitæ and Red Cedar. The last named, from Union county, in this State, and the others Mr. O. personally attended the gathering himself in the north part of Wisconsin. We are thus particular, for most people lose a large share of their young Evergreens by exposure to our hot sun and drying continental winds the first season after setting them out on the prairie. We have been successful with putting them in the shade of other trees and protecting them from the sharp prairie winds, but the plan of the Messrs. O. & M. is doubtless the best under all circumstances, when we consider growth and acclimation. Their loss is about ten per cent.

Evergreens from Seed.—They have planted about seventy dollars worth of European Evergreen Seed under this same protection, but without success; and some two hundred Norway Spruce plants is the result. The seed was sown in a black loamy soil, made up into seed beds. We should have stated that for the convenience to water, these Evergreen beds are located on the lower grounds or the black mucky loam. The seed requires sand, and hence the failure.

Grey Willow.—The want of timber on the prairie, has been felt by all, but to grow trees and transplant from the nursery has been more expensive than many can afford; it is true the Cottonwood would grow readily from cuttings, and make a rapid growth, yet the wood is of little value, and it also affords a good harbor for insects. In the Grey Willow we have a rapid, clean growing tree, valuable for shelter from the winds, good for rails and fire-wood; added to this, it can be grown from cuttings at a mere nominal rate. It is well known that charcoal for powder is

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made from the Willow; and it is this same Grey Willow that is used at Wilmington for this purpose, on account of its rapid growth and valuable qualities. For fire-wood alone we think it will pay to plant it. The grain is straight, and it splits freely into rails, and when laid up from the ground must prove durable. They have some trees four years old from cuttings eighteen feet high and five inches in diameter six inches from the ground. Thus it will be seen that it will soon make not only a shelter from the bleak winds in a short time, but also material for farm purposes; or to be more explicit,

"In summer shade,
In winter fire."

We would not place it in advance of our Silver Leaf Maple, but for a cheap, quick grown shelter, it is among the most valuable that we have seen; and when we take into account that the cuttings are sold at the low rate of three dollars a thousand, and that the tree will grow on high or low prairie, certainly no farmer need longer to have his buildings and house grounds stand out unprotected from the keen winds of winter. A belt of these Willows guard an

Artificial Fish Pond, fifty by one hundred feet scooped out of a low place in the prairie, and which is supplied with water from the mole drains, running through the depressions of the prairie swells. The pond is six feet deep, and stocked with cat-fish—some of which are now fifteen inches long—bass, silversides, perch and horse-fish. The Messrs. O. & M. are large growers of osage plants, fifty acres of which they have in fine order. The seeds—forty bushels—were soaked in this pond for several weeks, and planted at the time of sprouting. Thousands of our prairie farms can have just as good ponds with a trifling outlay, and which will, at the same time, furnish an abundant supply of water. Until we saw this pond we had no idea that such a luxury could be had upon our own farm, but now we are positive that it is of easy attainment, and the thing must be done. The earth must be either wheeled or hauled out, and this must be done in winter or other leisure time. A small hand pump will be needed to keep the water out while excavating the pond.

Osage Hedge.—To Messrs. O. & M. much is due for the introduction of the osage for hedging. They have grown large quantities of the plants, at the same time, they, like others, did not fully understand the habit of the plant, and hedging made poor progress, and most hedges have been turned out in bad order; but now it is

can then be trimmed or not, to suit the fancy of the owner. We saw a fine hedge set in June, of plants returned to them as worthless. These were soaked in the pond for a week, and then set out, and the hedge stands as pretty as any that we have seen. We mention this to show the value of soaking the plants before setting, when they have become partially shriveled by long exposure in shipping. Had these plants been set after their return without this precaution, few of them would have grown. As it is, they will, in four years, make a fine hedge, and at a cost, we think, of less than fifty cents the rod.

Sorrel on Strawberry Beds.—Mr. O. called our attention to the sorrel that had been received among his strawberry plants, and which would, in a short time, ruin the beds. He considers it the worst weed that we have for this crop, and would warn all planters to guard against its introduction. On new land it grows with great vigor and will soon run out the plants.

The Dioscorea Batatas.—Three years since they set out three thousand cuttings of this plant, nearly all of which grew. They are nearly hardy, killing back but little. At the end of two years they are dug, when the roots are of fair size, but of little value for food.

The Lawton Blackberry.—Here it is well loaded with fruit, though not protected; with slight shelter it promises to be valuable.

The Orchard.—It is trained with heads three to four feet from the ground, and is located on a northern slope, but it is yet too young for bearing. The whole grounds are new, say four to five years, and contains over two hundred acres, which, in a few years, will be one of the establishments of which Illinois will be proud.

The Nursery.—The stock of apple trees in the nursery is large, and the trees are very thrifty, though like most nursery grown trees have been pruned too freely. The time is not far distant when nursery trees will be nearly innocent of the pruning knife of the nurseryman, and turned over to the orchardist with heads unkempt, to be by him regulated to the proper form. The experience of the "Old Doctor," Dr. L. S. Pennington, of Sterling, Whiteside county; of Dr. Haskel, late of Rockford, now of Michigan, and others, have freely settled the value of low heads, or the non-nursery-pruning system. The low heads and symmetrical form of the trees in the grounds of Charles Kennicott, pleased the Committee, by far, more than those of Messrs. O. & M., though their trees in all other respects, are very fine.

In the arrangement of the varieties, the Messrs. O. & M. have adopted a plan highly commendable. In setting out the grafts into nursery rows, they begin with the earliest of the summer varieties, and those maturing in succession are arranged according to season. In this way it is easy to make a selection of a succession

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of fruits so highly desirable, but which is too often overlooked in the hurry of the spring and autumn sales, by the busy nurseryman. This arrangement will at all times save labor, and tend to a better selection, for the value of varieties of the same or nearly the same time of maturity can be the more readily discussed, and selections made with a much better understanding of the wants of the planter.

Great pains have been taken in this selection of trees, to have none but the best; that is, to combine hardiness, thrift, good quality and productiveness. The long and varied experience of Mr. O. has eminently fitted him to arrive at conclusions that are reliable in this respect. A careful and close observer of the effects of climate on fruits, he was among the first to discover that certain varieties must be discarded, and that nothing short of actual trial could be relied upon to settle the value of any particular variety on the open prairie.

The confidence of these gentlemen in pears is of a low order, and they pay little attention to this fruit. Cherries, with the exception of the May cherry of the West, have given them as little satisfaction. This May cherry is probably the same as that described by Downing as "Kentish," and sometimes, but not always, sold under the name of Early Richmond. The climate of Bloomington not being adapted to the peach crop, little attention is given to grafted or budded trees, as the common seedlings are found more hardy and reliable. Their stock of ornamental trees, plants and shrubs is large, and the plants are well grown.

Thus far they have paid little attention to shelter, not from any lack of a full belief in its value, but for the want of time to plant the trees. When we can consider the recent establishment of these large gardens of fruit and flowers, we can but know the owners are men of skill, and of the most untiring perseverance, and who cannot fail of success now and hereafter. A half a day was too short to do full justice to this place, but trains will not wait, and Committee must hasten forward.

Timber Belts.—Soon after dinner Mr. O. gave us a ride behind his mules to the farm of Mr. Osborne Barnard. On the way we passed the farm of Mr. K. H. Fell, who is well known for his interest in tree planting. For timber belts he uses the silver leaf maple, and sets them in rows eight feet apart each way. Three of these rows make a good belt, and occupy, on forty acres of land, four acres. But this land is not lost, as by planting eight feet he will have a good growth of blue grass for winter feed for his stock, or he can grow the Lawton blackberry, or Black Cap raspberry to good advantage. The belts are now in corn, so that the cost of culture is but a trifle more than that of an ordinary crop. Another year's growth of the maple will put an end to the corn crop.

State Normal University.—This being in our way we spent an hour in the natural history room, in admiring the fine specimens

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of birds put up by our friend Holder, and the extensive collection of rocks, coals, etc., by the industrious Wilber, and the fine painting of the young artist, J. E. Bryant, nephew of our illustrious poet of the same name. Mr. Hovey was absent at Washington arranging for a regiment of teachers and students to fight the battles of his country.

A Twenty Acre Farm.—The only entry of a twenty acre farm was that of Mr. O. Barnard, near Bloomington. The farm contains in all twenty-five and a half acres, less the highway on one side and a lane on the other, and is occupied as follows:

	Acres.
Corn	9
Spring Wheat	5½
Oats	1½
Meadow	2½
Orchard	½
Road and yard	1
Potatoes	6
Total	25½

Five acres of the corn land was in corn last season, plowed a foot deep and heavily manured, most of the manure hauled from the city. The other was a pasture field previously manured. On one corner of the five acre lot four loads of gas lime had been spread. Last year the crop was not as good on it, but now we can see no difference between it and that treated with manure. The pasture land was plowed eight inches deep. A single mole drain had been run through the five acre field, and along its track the corn was much the best. The line of drain could be easily seen in looking over the field. The whole nine acres presents an immense growth. The corn is drilled in rows about three feet apart and cultivated with double shovel plow and cultivator—flat culture and all weeds destroyed. The potatoes are very fine. The land was manured and plowed deep; rows three feet apart, hills one foot, with one eye in a hill; cultivated with shovel plow; variety mostly Neshannock; uses large potatoes for seed. The wheat crop was exceedingly heavy in the straw, but the berry was not well filled.

The Meadow is a mixture of timothy and clover; was very heavy, having been top-dressed after harvest last year, seven loads of well-rotted manure to the acre. From our experience and observation, we think a top-dressing of manure, immediately after the hay has been taken off, the most valuable treatment that can be given a meadow; it answers as a mulch to protect the exposed roots from the sun, and on the first rain the aftermarths spring up with

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with even a light top-dressing we have always formed a good after growth.

The Orchard has been set four years and begins to show a few specimens of fruit. The varieties were not well selected for a family orchard, and will need to be extended for this purpose. An orchard of this kind should contain a good proportion of summer and autumn fruits adapted to cooking. It is a mistaken notion that we need most of the table sorts. Such apples as the Keswick Codlin, Holland Pippin, Yellow Belleflower and Stannard cannot well be dispensed with in the kitchen, so long as apple pies, dumplings and tarts are great staples of health and good living. The orchard has made a vigorous growth, having been cultivated in low hoed crops—this season in butter beans for the city market. The orchard contains sixty-two apple, a few pear and plum trees. On the west side is an Osage hedge and a belt of forest trees, about two rods wide; on the east, and next to the house grounds, a screen of arbor vitæs, which, in a few years, will add much to the beauty and value of the place, breaking off the south-west winds of winter from the building.

The Garden is among the best, and contains all of the small fruits, with an ample supply of vegetables, and is under the more immediate charge of Mrs. B., not that she does all the labor of digging, planting and weeding, but directs and superintends its management. The crop of currants, gooseberries, raspberries and grapes would make glad the family of many a "large farmer."

The Front Yard is set in blue grass, and more or less planted to evergreens and small flowering shrubs and plants.

The Fish Pond, near the north-east corner of the farm, is a small rush pond; this is being carted out and the muck spread upon the upland, and thus far with valuable results. This pond, when thoroughly cleaned out, will form a valuable fish pond, and, at the same time, supply water for the stock. The sub-soil at this point being a tenacious clay, is well adapted to mole draining and will thus supply water to the pond in sufficient quantity for the above purposes. The farm is divided into three fields, and this season will afford no pasture, and the stock is pastured on an adjoining farm.

The Barn cost about eight hundred dollars, and is divided into stables, granaries, tool-house, carriage-house and threshing floor. The hay and grain is stored overhead. For a farm of this size it is exceedingly convenient. The house cost about fifteen hundred dollars, is of wood, with a good stone cellar, with cement floor; the well and cistern are supplied with excellent pumps, and everything is arranged for comfort and convenience, and we have no doubt that three women in this house can accomplish more than four on the average of our farms. The style of the furniture and of the

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living is that of the wealthy class of our city families, and this from the twenty-five acre farm.

The Stock consists of four brood mares, that do the work, and this season raised three colts; these are bred from the best horses, and of course bring a high price; in fact is one of the main points from which the profits are drawn. One cow is all of the horned stock, but this is none of your cheap kind; she is a milker of the first order, and supplies the family with an abundance of milk and butter. Eleven head of aged porkers are this season deprived of their usual pasture, and depend on weeds and corn for forage; but they appear to have a good time, judging from the amount of fat they carry. They include Berkshire and Graziers from the stock of Mr. Crowder, of Sangamon county, with two or three of the Polands. The quantity of poultry is small, much less than would prove profitable. The fences are of the board and post, with some young hedge too young to turn out. On the farm are several hundred rods of underdrain, part of it mole and part made of boards and filled in with earth. Wherever these drains occur we can see a marked difference in the crops. No weeds are allowed to grow on any part of the farm, and now, after five years, the seed seems almost exhausted, and the crops are easily tilled, though one hundred loads of manure are hauled from the city and used for top-dressing, in addition to that made. With the aid of one hand for six months, Mr. B. has done the farm work. Last year his sales amounted to over seven hundred dollars; this was for colts, pork and farm products sold not estimated.

The farm cost originally forty dollars an acre, partially improved, and the improvements must have cost about one hundred and twenty dollars per acre more, and the stock, tools and furniture another thousand, making an outlay of about five thousand dollars. The farm is three miles from the center of the city of Bloomington, and of course just in the suburbs; in fact, Mr. B. is a suburban farmer, with an abundance of means aside from his farm, and of course is under no obligation to do more than he pleases, or to make his living exclusively from his well-tilled acres. He was formerly a large farmer in Ohio, and of course a slave to his hundreds of acres; inured to a farm life, he would be lost in any other employment, nor could he be satisfied to rust out in inglorious ease. He, therefore, wisely selected the number of acres that he could till with his own hands, and without making his wife a kitchen drudge, as is the case on most large farms. We do not hold this farm up as a pattern for the farmer of limited means, but to show there is more real profit and enjoyment on a small, well tilled farm than on the larger ones. The nearness of market and the judicious selection of the crop have had much to do with the success; so of a liberal supply of manure from the city that has only cost the hauling.

A forty acre farm would more nearly suit our views of a small farm outside of the city. This would afford pasturage, and for the

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majority of small farmers with large families be more desirable. We cannot close with this farm without remarking that we have never seen a farm of its size managed with the same economy of labor, nor so many of the comforts and conveniences for a family of five persons so ample and so well arranged, procured by their own labor as in this case. Truly the small farmer is the *independent farmer*, while the "large farmer" and his family are slaves to their broad acres.

As Mr. B. will make a report of his crops and mode of farming to you, we will leave the subject for the present.

At six o'clock A. M., of July 26th, we parted with Mr. B., and took the train for Springfield, to examine the pear orchard of John S. Bradford, which is about one mile west of the State Capitol. The land is rather too flat for orcharding, and liable to damage from late spring frosts. Mr. B. has a plat of ten acres, forming a desirable suburban residence, upon which he has placed a fine residence and ample out buildings, and during the hours of relaxation from active city business he has made a small paradise, redolent with rural beauty and the substantials of good living.

The soil is a clay loam, with rather a retentive sub-soil, but the whole is underdrained with brick tile to the depth of two and a half feet (too shallow—should have been not less than three feet,) at a distance of twenty-four feet, which, on the whole, makes pretty efficient drainage. We wish that every farmer in the State could see the rank growth of corn and vegetables on this underdrained land, with ordinary culture and without manure; we think they would open their eyes a little, and possibly conclude that tile and the spade are equal to a *little more land.* The dwarf pears are set eight by twelve feet apart, a part of them were two, and the remainder three years old from the bud when set, and have been set four years, and they number four hundred and fifty trees. Of course, on this soil, and with the culture they have received, they are very thrifty. The trees were from the same nursery, of the same quality, and procured at the same time with those of Mr. Yates, at Tamaroa. They are now larger and more vigorous than the latter, which is to be attributed to the effect of the perfect drainage. Mr. B. has cropped his grounds to corn or vegetables, while Mr. Y. has cultivated the trees only. We prefer the cropping, especially in corn, but would not plant nearer than four feet to the tree; leave the stalks standing until spring and then plow them under. The corn protects the tree, while growing, from being swayed over to the northeast, and in winter modifies the sudden changes. In the orchard, like that of Mr. Yates, there is a large per centage of varieties that appear to be of little value with us. The Bartletts are, as usual, well loaded with fruit, notwithstanding the complaint of late frost. The same may be said of Swan's Orange, Louise Bonne de Jersey and Madeline, while Stevens' Genesee, Summer Belle, Beurre Diel and Winter Nelis have a fair show of fruit. The

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same worm that disfigured the fruit in the orchard of Mr. Yates is also here, but to a much less extent. The trees are very healthy, and with the single drawback of topography give promise of rich returns. The underdraining will, to some extent, modify the effects of spring frost, and another season we shall hope to see the whole orchard loaded with rich clusters of melting fruit.

Dwarf Apples.—Mr. B. has two hundred dwarf apple trees in the same grounds, set at the same time with the pears. They have made a fine growth, but as yet show no fruit. Certainly, with the treatment given, the dwarf apple on the prairie thus far has proved a failure.

In our journeyings of the week we have been greeted at every turn with military preparations, and at times have almost been led to distrust the value of our commission—but when we look to the thousands of homes that stand out in the glare of the noonday sun; when we see thousands of children playing at the roadside and on the shady side of buildings—when we see great corn fields flanking and inclosing the dwelling and usurping the garden—when we see the pale faced mother at the window, around which clusters no vine, no smiling flower, and the yard grown up with noisome weeds—when we see the well but a sink hole at the edge of the slough—when the cistern is but an old barrel, warped and distorted in the sun—when the farm tools are unhoused and the stock depending upon the friendly shelter of a worm fence, we feel that there is yet a mission for us, and that the agricultural society are wise to pursue their onward progress, and continue to hold out rewards for the improvement and the beautifying of our homes.

July 29th. A day of rest, after a week on the cars and in rambling through orchards and over large farms, is a luxury, as well as a necessity. Were it not for this seventh day we should have no stopping places in the journey of life, no breathing spell, no enjoyment of the beautiful, but a tireless task like the continuous running of a river. Surely the Sabbath was made for the farmer, that he could rest him from labor and admire the handiwork of the Creator, whether in the waving branches of the leafy forest that sends forth its grateful shade to shut out the heat of the summer sun or shield him from the winter blast.

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July 30th. At eight o'clock A. M. all of the members of the committee took seats in the cars of the lake shore road for Waukegan, and at Evanston were joined by Mr. C. D. Bragdon, the Western editor of the *Rural New Yorker*. A pleasant ride of two hours along the forest skirted shore of the lake, passing several pretty suburban towns, we were duly set down at Waukegan, the "Little Fort" of the olden time. Here the beetling cliffs encroach upon the lake, and upon which stands the beautiful city of Waukegan. Years ago, before grey hairs had invaded our brow, we had spent a week's fishing on the shore, and had wandered through the forest aisles where now stands the city; but a few years ago and this was a part of the unbroken forest that swept up from the Chicago river and joined hands with the vast wilds of the north. Now we have broad, well paved streets, lined with stores and shops, and out of the din of business hundreds of residences surrounded with the waving drapery of forest and floral verdure. Certainly this city, in point of picturesque beauty, is not surpassed, and for the luxury of fruit and beautiful homes has few equals. At the end of one of the main streets leading north, we come to the beautiful grounds of Robert Douglas; graceful walks of the lake gravel wind among magnificent conifers, pears and dwarf apples loaded with fruit, flanked with shrubs and flowering plants, occasionally relieved with a patch of lawn with its closely shaven blue grass carpet. It is a fairy picture, a commingling of the useful and the ornamental, all draped in beauty. No professional landscape gardener had a hand in this—it was designed for use—but it has grown up a place of beauty. The specimens of Austrian, Scotch and White Pine, standing singly on the lawn and in front of the house, are among the largest specimens in the State, while the Balsam and Black Spruce, from our northern forest, are unexcelled; in fact, one specimen of the American Black Spruce, twenty feet high, cannot be surpassed by any of the European Norways; its drooping, graceful branches can but challenge the admiration of all. A few years since the grounds were covered with a heavy Oak forest, but this was cleared off and the stumps grubbed out, the surface leveled, walks laid out and the grounds planted. To the east is the lake, now presenting its peaceful mood, as it reflects the sun, with the thermometer at 97 deg. in the shade; to the north and west the forest is driven back a mile, but its kindly influence is yet felt in winter and early spring. Never have we seen grounds more conveniently planned and so well planted as these. Walks bordered with fruit and flowers, clumps of conifers, of pears, and of dwarf apples, fringed with small fruits. Among the pears, Bartlett, Louise Bonne de Jersey and Flemish Beauty are the favorites, and well they may be, for they are loaded with fine specimens of melting fruit. The cherry slug has been somewhat annoying, on both cherry and other trees. The remedy is simple: Sprinkle the trees in the middle of the day with dry dirt, simply dust it on the leaves infested, the dry earth adheres to

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the slimy coat of the slug and kills him. Some specimens of the native Larch are very fine, but this we think due to the sheltered situation, and we would not recommend their planting when the European can be obtained, as they are, in all respects, much more desirable. A small shrub of the Japan Quince is loaded with fruit —a rare occurrence in this part of the world. The yellow Siberian Crab should oftener find a place in our ornamental grounds. The tree itself is beautiful in form, in foliage, in bloom and in fruit, presenting through the season, in all its changes, a succession of beauty, to say nothing of the value of the fruit.

Dwarf Apples.—It would appear that, notwithstanding the dwarf apple does not fruit well on prairie soils, yet on timber land they promise better, if we take the numerous specimens in these grounds for proof. Among them we note Twenty Ounce, Waggoner, Early Strawberry and the Baldwin, in this clump of trees, completely sheltered, as it is proven a good bearer. Mr. Douglas suggests that the mode of setting the dwarf apple may have something to do with its productiveness. He says that the stock of the dwarf apple, like that of the pear, is tender, and needs the same treatment; that is, the stock should be below ground, yet not so deep that the graft will take root. If the stock is above ground, the winter frost will so weaken it that the tree will cast its fruit or not set any fruit buds, and if set deep will root from the graft, and the tree will then no longer be a dwarf. It is possible that there may be much truth in his suggestions, for we know that in setting out dwarf apples little regard has been paid to these points.

As low headed trees on their own stocks in these grounds have produced good returns, at the same age, we can see no need for the dwarfs, more especially when such nice care must be bestowed, not only in the border, but in the amount of shelter.

The dwarf pear came near proving a failure with our Western planters from the same cause, and now we are careful to plant them so that the junction of stock and graft shall be just below the surface of the ground. The apple trees of Mr. D. have been set five years, and have produced large crops of fruit. We think those on timber land, by regarding the above hints, may feel a reasonable assurance of growing fruit on the dwarf apple; at the same time we should feel safer with the Keswick Codlin, Yellow Ingestrie, Summer Rose, Red June and Hawthorne, treated as dwarfs and planted in clumps, than with the ordinary selections of dwarf apples. The above are early and abundant bearers, have a dwarfish, compact, symmetrical habit, and are valuable for cooking. To these we might add Red Astrachan and Duchess of Oldenburg, where space was abundant, and a large quantity required. The dwarf apple mania has had a good run at the West, but thus far without satisfactory results.

The Hot Wind.—About the middle of June the wind blew a

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gale from the southwest for two days; it was hot and dry, and crisped up the leaves of forest and other trees, and in many cases killed the tender shoots. Its effect is visible in all directions on the south and west sides of trees and shrubs of all kinds. The fruit has also been materially lessened in both quantity and quality, those most exposed more seriously than those under shelter.

The Lawton Blackberry.—In the grounds of Mr. D. this fruit maintains its Eastern reputation, and the canes are loaded with fruit just beginning to change color. They evidently like shelter here on the lake shore and in timber land. Mr. D. has an acre or more set out for fruit, from which he will reap a rich harvest, and so well is he pleased with them that he is intending to extend his plantation. They need winter protection and shelter from the winds, when we think they will prove valuable. A light covering of straw thrown on them is all that is needed; this, of course, cannot cost much, and will be well repaid in fruit.

The Dorchester is, doubless, a great humbug, notwithstanding the indorsement of the Massachusetts Horticultural Society. Here are plants from a celebrated Boston house. A part of them have strong green canes, with small fruit of little value, and a part have red canes with the smallest fruit, the whole doubtless picked up by some arrant wag who named them Dorchester, and imposed upon the good natured members of the society.

In these closely planted borders the Mahonia stands the winter and appears healthy, while many other half hardy plants are quite at home. The Horse Chesnut is a fine tree along the lake shore, and should be more often planted.

The gem of the place is a hedge of red cedar, separating the house grounds from the fruit garden and nursery. One of arbor vitæ to the north of the house, two years set, promises to rival it. Mr. D. has made free use of evergreens for his shelter. To break off the northwest wind, a line of white pines were set some years since, about four feet apart; they are now over twenty feet high, and form a wall against the winter blast, when the foliage has dropped from the clumps of deciduous trees, and they no longer hold it in check. Just think of it, a belt four hundred feet of a hundred trees, costing fifty dollars for plants and labor! Why, you could not purchase it after ten years set for ten times the amount, for while it is at all times beautiful, it is eminently useful.

Currants.—Mr. D. has a large number of the white currants set in the shade along his borders, and at this time they are loaded with ripe fruit, the shade delaying them some two weeks. We have never seen so fine a show of this fruit, and even here, on the lake shore, shade appears to be of value to them.

The House Grounds, proper, occupy about five acres, and while they are most attractive to the eye they are also useful, and return

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to the owner several hundred dollars of solid cash, annually. The fault with our landscape gardeners is the intensely ornamental, ignoring the useful, giving us leaf and flower; but we have yet to learn that a Siberian crab is less valuable, if after the spring clothes it in gorgeous floral beauty, and the summer robes it in richest verdure that the autumn may not drape its branches in clusters of valuable fruit. We like this commingling of the ornamental and the useful, and would not have them separated and a hedge set between them. To those about to plant extensive grounds, we commend those of Mr. D. to their consideration.

Evergreen Seedlings.—Mr. D. has been very successful in the growing of evergreen seedlings. The beds are made of sand and shaded with frames of lath four feet square, the opening being about half an inch, using inch wide lath. These frames rest on stakes about eight inches high, allowing the wind free access under them, after they are up and out of the way of the cedar bird, who is very fond of them while young; it keeps him out; boards are put to the sides of the beds until about the middle of June. It will be recollected that Messrs. O. & M. failed to grow seedlings on common prairie soil, and we believe others have had indifferent success; this has been the case with us. We see no reason why we may not succeed with the use of sand and similar frames, though we may not do as well for want of the lake wind, as Mr. D. Although a long drouth has effected many other plants, yet those seedlings do not appear to suffer in the least, although they have not been watered at all.

Pear Seedlings.—In these Mr. D. has not been as successful as he desired. He sowed a large quantity of imported seed, all of which came up well, but in a part of the grounds a liberal supply of manure was used, and the white grub has destroyed them by the thousands. In the unmanured ground the stand is good, and the plants are very fine. Pear seed should be sown on virgin soil, deeply sub-soiled and thoroughly pulverized.

Dwarf Pear Orchard.—The dwarf pear orchard numbers some one thousand trees, four hundred of which are in bearing. The leading and most profitable varieties are: Bartlett, Louise Bonne de Jersey, Seckel, Glout Morceau, White Doyenne, Swan's Orange, Madeline, Stevens' Genessee and Winter Nelis.

The truth is, that one-half of the dwarf pear trees in this State are of no value, and never will be, for the simple reason that the varieties are not adapted to the soil and climate. We hope planters will take lessons from substantial facts, and in making out orders for trees, will order what they want. It is better to pay a hundred dollars for a hundred trees that will bear good crops of fruit than to take a medley of varieties, two-thirds of which may prove worthless, even if they are purchased at half price. So far as our observation extends there are a few varieties that prove

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hardy and reliable bearers, while the great number of varieties are to us worthless. These varieties appear, with limited exceptions, equally valuable in all parts of the State, and of which we shall have further occasion to speak.

The Standard Pear Orchard.—Among standard pears, the Flemish Beauty is esteemed by Mr. D. the best of all, and right well does it maintain this character, trees but half a dozen years set producing five bushels of fruit each. They appear to vie with the Keswick Codlin in early and abundant crops. The standard orchard entered for the premium contains one hundred and fifty trees set ten feet each way, and treated as dwarfs. They consist of Bartlett, Flemish Beauty and White Doyenne, these latter having the tops regrafted to the Flemish Beauty. The trees have been four years set and have made a remarkable growth. There can be no question that this style of growing pears is the true one, though the distance apart is doubtless too small. They would be readily taken for vigorous growing dwarfs. The soil is a rather stiff clay loam, thoroughly underdrained, which is the case with a large part of Mr. D.'s grounds. The orchard is planted to the Lawton Blackberry, now in the second year, and well loaded with fruit. At present these fruits agree pretty well, but in three or four years we suspect the pear trees will require all the space. It will be seen that Mr. D. has selected but two varieties for his standard orchard, having, by regrafting the White Doyenne, placed that variety out of the list. There can be no question as to the correctness of this choice, taking a series of years together; both are vigorous growers, abundant and sure bearers, and both of the best quality of fruit. Were we to add to the list, we would include Stevens' Genessee, Louise Bonne de Jersey, and Fondante d'Automne, and for winter, Winter Nelis.

The Nursery grounds of Mr. D. contain thirty-two acres, closely planted. Dwarf and standard pears, apples, the small fruits and evergreens are the leading staples, though a liberal space is given to the floral department, where the dahlia and peonia stand at the head, and are rather specialities.

We next visited the pear orchard of A. S. Sherman. Mr. S. purchased the grounds some half a dozen years since. It then contained twenty-five dwarf pears, then six years set, making them now twelve years from the setting. Most of these are Louise Bonne de Jersey, and now loaded with fruit. The trees are large and vigorous. They stand upon the summit of a pretty high ridge, with good natural drainage and protected on the north and west by a large apple orchard, building and shade trees.

Boulders for Mulch.—These large trees are mulched with a liberal supply of granite boulders, which protect the roots and maintain the trees in place. Mr. S. has five hundred dwarf and standard pear trees and all of them have rock mulching. The

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newly set trees first receive a good coating of straw or prairie hay, and as his stock of boulders were exhausted by the large trees, he uses quarried stone to place about them. From the very vigorous growth of his trees we must infer that this treatment is of considerable advantage, and we feel disposed to recommend it when the stone can be readily procured. His young orchard is set eight by twelve feet, half dwarfs and half standard, set alternately. Among the standard is one hundred and fifty of the Flemish Beauty, and one hundred and twenty-two of Louise Bonne de Jersey, almost the entire amount of the standard. When we consider the multiplicity of new pears and the desire for novelty, we may consider our Waukegan friends a little old fogyish in their adhesion to old and well tried friends; the result is plenty of fruit, while those who run after novelties have plenty of trees, such as they are.

Bark Lice.—The bark louse had become so abundant on the apple orchard of Mr. S. that fears were felt of its destruction, and it became necessary to look after some effectual remedy. Mr. S. uses linseed oil and tar in equal quantities. These are mixed over the fire by a gentle heat, to dissolve the tar. This mixture is put on with a brush at any time during the winter or early spring, and has the appearance of a varnish. It has the advantage over the alkaline washes used on the young insects, that it can be applied to all parts of the tree without the least injury to the shoots or buds, while it is death to the insect. His trees are nearly free of the insect, and have become vigorous and fruitful.

The Lombardy Poplar is being used by Mr. S. for a belt on the outside of his orchard for shelter. They are of rapid growth and easy culture, requiring only cuttings set three feet apart and cultivated for the first two years, when they will have become well established. Mr. S. has planted a part of his pear orchard to strawberries, but we apprehend that he will not find them a desirable crop; better put in small hoed crops.

Transplanted Forest Trees, of Mr. Charles E. Peck, of Winetka, Cook county. Mr. P. has twenty-two acres, which, last year, was dignified with the name of farm, and upon which he received the first premium for the best farm of twenty acres. If twenty-two acres, surrounded with an expensive rustic fence, ten of which is laid out into park and twelve of it into the most beautiful ornamental grounds, with its miles of graveled walks, and thousands of ornamental trees, plants and shrubs, with a mansion and out buildings costing sixteen or seventeen thousand dollars, is a farm, then this is one, but not such as should be recommended for the small farmer, unless his rent and bank account was more ample than that of most small farmers. We have a curiosity to see the report of the committee and to learn something of the working and culture of this farm. No man better understands the culture of the soil than Mr. P., for no such suburban home has been carved out of

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the forest belt that fringes the lake as this. There are more costly buildings, more ornate inclosures, but for gems of forest beauty, we can safely challenge the West. Conifers of the most symmetrical and vigorous growth, elms, maples, ash, linden and other deciduous trees, presenting such a wealth of foliage that we suspect that they had no relationship with those of the primeval forest. Yet such is not the fact, for five years since they stood under the shade of the parent tree, and were torn from their home and transplanted to the broad lawns that they now so proudly grace. We have but to carry the reader back half a dozen years to show him this place with its tangled brushwood and forest of lofty oaks, on the high ground, with giant black walnuts, lindens, ash and water oaks at the front of yonder slope, where the dripping from the upper "steppe" had formed a morass over whose treacherous surface it was dangerous to drive. The timber was cut down and sent to the city for wood, the stumps dug out, the surface leveled and miles of underdrains laid deep in the soil. The trenching spade was used with no stinted hand—walks were laid out, trees twenty feet high brought from the open woodland and set out, the choicest and largest conifers were purchased without regard to cost, the lawn was sown to blue grass and the borders set with shrubs and plants, and thus five acres were devoted to the beautiful. On the remaining seven stand the family mansion, a house for the hired help, a carriage house, barn and extensive sheds, a magnificent young orchard and extensive fruit and vegetable garden. All of these are well arranged and kept in the most admirable order. The underbrush was cut from the remaining ten acres, the surface leveled and sown to blue grass. In this woodland was a small slough, the muck from which has been hauled to the barn-yard and composted with manure, with which to dress the lawn and to stimulate the orchard and the garden. In a short time the slough will be a fish pond, swarming with fry for breakfast. Call you this a farm, from whose willing surface you could clothe and educate a family and lay by sufficient to set up the young people in business when they leave the parent hive? We think not. It has one of the first elements of a farm—underdraining and a valuable fruit and vegetable garden; the lawn supplies the hay and the park the pasture, and in this respect it might be called a grazing farm—for aristocratic cows. But Mr. P. is a farmer, and has a fine farm a short distance to the west, on which he has some of the best stock in the State. At this point the lake comes up to a bold shore some forty feet high; for the next eighty rods the ground is very level, though gradually rising some ten feet for ample drainage, then we have a rise of thirty feet in the hundred to the upper land, along which runs the railroad, and from which you can look out on the broad expanse of water.

The Orchard is set with alternate rows of standard and dwarf apples, and though on land somewhat similar to that of Mr. Doug-

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las, who is successful with the dwarf apple, yet they have not succeeded well here. The trees are remarkably vigorous, but as yet show little fruit. They are four to five inches in diameter. At the same time the standard trees set with them are yielding good crops. Among them the Duchess of Oldenburg and Keswick Codlin are great summer favorites. We can only account for this freak of the dwarf apple upon the hypothesis of Mr. Douglas, as mentioned in this connection. On the west the grounds are protected by the park, and on the north by the old forest, and are partially open to the south and east. The good taste of the people having saved from the axe numerous specimens of the old forest, gives to the village a rural beauty most desirable.

The Fence is a rustic picket, posts and scantling put up in the usual way, only higher, as the fence is six feet high. The pickets are round saplings not less than one inch at small end nor more than two at the large one. These are cut in summer when the bark will peel, are stripped of the bark and nailed on while green. At that season of the year they soon become dry and hard as a bone, and make a very strong and desirable picket. As compared with pine or other sawed stuff they are more durable, strong and in better taste for grounds of this character, most especially about the park, and we take the occasion to commend it in place of the old worm rail fence about all woodland pastures.

The Birds.—In all orchards near the woodland we hear doleful complaints of the birds depredating on fruit of all kinds, and here they appear particularly troublesome, the raspberries and currants are spirited away, and the early apples are bored into. There appears no other way than to grow a supply for them.

Grapes.—In the garden of Mr. Wilson, near by, we saw some of the most vigorous vines of the Isabella that we have seen, and such bunches of fruit in the open air we did not suppose possible. We could hardly believe our eyes, yet here was the fruit, color and form of the leaf of the true Isabella, but the size of both fruit and leaf staggered us. Mr. W. would not admit more than underdraining and the spade in his culture. If this is true we would advise vineyard culture along the slopes of these lake steppes, for the genial hills of Cincinnati are no match for them. The soil is clay loam, friable and yielding in its composition. Mr. W.'s fruit trees are loaded with fruit beyond anything we have seen. Certainly there is some advantage of either soil or culture, but our visit was confined to a short morning hour before the leaving of the train. Here, in a few rods square, was no small amount of grapes, plums, pears and apples, and the finest lot of vegetables, sweet potatoes included. We often hear farmers talk of these retired city folk, as though they knew little of the culture of the soil. But they forget that they are investigating men, and soon dive into the hidden mysteries of deep tillage, thorough culture and composting of fer-

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quality of products. Of course there is a class of city parvenues who affect to know everything, and who really know nothing nor never will.

A ride of four miles brought us to Evanston, at which point we met Mr. H. M. Kidder, of the firm of Kidder & Knox, and the managing partner of the firm. They have forty-five acres underdrained with pipe tile, all of which is being prepared for small fruits.

The soil is a low marshy flat, of the most unpromising description, of no great value for grass, and in its natural condition useless for culture, except a narrow ridge near the lake, which is sandy and produces good crops of vegetables when well manured. The fall in 110 rods is but five feet; all the water that falls on the surface must be evaporated or slowly find its way to the North Branch of the Chicago river. The land lies about thirty feet above the lake. The sand ridge before noted is some fifteen feet high, and at its base for some distance the spring forms a swampy soil, which is composed mostly of quicksand, but so soon as we come on to the clay flat, there is little appearance of water, even in the deep drains, so indurated is this cemented sand, gravel and clay that forms the subsoil. The farm contains over two hundred acres, forty-five of which have been drained. The main drain is sunk four feet deep, and is formed of inch pine stuff, with an inside opening of six inches; into this the side drains are discharged. These are sunk three and a half feet, but are kept to regular grades, and in some places are five feet deep. At the distance of two feet is a thin layer of quicksand, just under the peaty soil, where the almost impermeable subsoil is met, into which the tile is sunk a foot and a half. The drains are placed four rods apart, which Mr. K. considers ample. During heavy rains an immense amount of water is discharged, but as the soil becomes weathered down, its surface more retentive and the sub-soil more yielding, this will be changed and the water more slowly discharged. The tough prairie sod is first broken in the usual manner, and in the following spring the land is plowed eight inches deep and sub-soiled to a depth, in all, of twenty-two inches. To give some idea of the solid nature of this sub-soil, we have but to recur to the level above the lake, which is about thirty feet, and then to state that the well is sunk sixty feet without furnishing more than a moderate supply of indifferent water, impregnated with the salts of iron. The soil is acrid, and will require thorough aeration before it will be valuable for all crops. Of this forty-five acres, two acres are set to Brinkle's Orange raspberry, plants set two and a half feet in rows, and the rows five feet apart. These are making a good growth—set last spring. Ten acres are set to strawberries, five of which are nearly destroyed by the white grub. This part of the ground had been slightly manured. Wilson's Albany and Triomphe d'Grand are the varieties set. The growth has been remarkably good, considering the newness of the soil. Ten acres

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were set to the American Black Cap raspberry last spring, but from some cause, probably from late setting, a large share of the plants failed to grow. Twelve acres were last year set to the Lawton blackberry, and which have made a moderate growth. An acre set to rhubarb has made a remarkable growth, the soil appearing to be well adapted to it. On this soil potatoes thrive, but corn is no favorite.

In working his grounds Mr. K. uses a one-horse sub-soil plow, and esteems it highly. It must be of great value in strawberry culture to loosen up the soil after the heavy rains of winter and spring. Mr. K. is a resident of Pittsburg, Pennsylvania, and does an extensive business in the growing of the small fruit shrubs for sale, and is well known throughout the West in this speciality.

That they will succeed we have little doubt, though we think they have not made the best selection of soil for their experiments, but they have gone to work with an energy that will accomplish success.

A Strawberry Patch.—On the western slope of the sand ridge before alluded to, Messrs. K. & K. have seven acres of bearing strawberry vines, all Wilson's Albany, luxuriant as need be. On account of the dry weather at the time of cropping, the yield was light, thus again assuring us that without an abundance of water at that time, that a strawberry crop is not the most certain in the world. The plants are cultivated in drills or hills about two feet apart, the rows of plants covering half the space. They are worked with a horse hoe, and the weeds pulled out of the rows by hand; they are in excellent order, and it would appear, to look at them at this time, that they could not fail of a large crop next season.

On the east or opposite side of the ridge, divided by the highway, is the experimental garden, where varieties are tested. Here we had a feast of Brinkle's Orange, Yellow Antwerp, and other raspberries. The Bri[illegible] are fast gaining favor, and as they produce an abundant crop, with slight protection, will soon be among the common garden staples of good living. Before we close with the subject we will say that many varieties of small fruits can be had of this firm at low rates, especially of strawberry, raspberry and blackberry plants. Mr. K. has no confidence in the mole ditches for his soil.

Returning to the city, we took the night train for Cortland, in DeKalb county, to examine the farm of S. W. Arnold, situated four miles south of the village. It was the first day of August, and the harvest sun continued to pour out its ardent heat, for the past three days, bringing forward the later sown grain rapidly, and from its extreme heat driving the laborer to the shade, or made him a laggard at his work as he breathed the heated air. Cortland is on one of the largest prairies in the north part of the State, and yet it is nearly all under culture, not in large farms, but in those ranging from eighty to one hundred and sixty acres. Spring wheat is the

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great staple, and the music of the busy reaper come to us on the morning air from all directions. Coming from the great corn zone, and passing through the woodlands of the lake shore, where the small farms are carved out with the axe, it is a change of feature to see field after field of ripening wheat, with an almost unbroken continuity, only now and then a green spot of corn, or may be a meadow or pasture, to vary the landscape. The fences are of posts and boards; three boards of six inches in width make the fence; of course, no pigs or sheep are allowed at large. Of sheep we saw none in the four mile drive, while each farm has its small hog pasture of one or two acres, where the lazy porkers take their ease and grow fat. Good Suffolks are the favorites, with now and then a cross of Berkshire by the way of variety. No better lot of hogs can be found anywhere than is now owned by our farmers, and it is money thrown away to send out of the State for better, for better cannot be had.

Orchard Protection.—About two miles south of the village is an orchard of two or three acres, well loaded with fruit, and to every appearance as healthy and productive as the best on timber land, but this orchard is completely sheltered by a belt of locust trees, two or three rods wide. This is the secret, and when our prairie farmers wish to grow fruit they must not forget that protection is one of the conditions of success.

Book Farming.—On the way our driver pointed out to us several "book farmers," men who wrote for the papers and farmed it according to convenience—who calculated their products by the number of acres planted without regard to culture. One was farming and studying law. If his law turns out as poor as his crops he will be but a poor specimen of the genus *shyster*. Others went upon the plan of farming made easy, and, judging from the light crops, they will have an easy time hauling to market. But the majority of the farmers of this four mile drive are successful, thrifty farmers. They lack barns, orchards and timber belts, it is true, but we were told that a few years since most of these men made their claims far out on the prairie, where the land could be had at a dollar and a quarter per acre, and in most cases have from these acres paid for them, and are now on the high road to prosperity.

A Hundred and Sixty Acre Farm.—The farm of Mr. Arnold

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45 acres	of	China Tea Wheat.
12 "		Rio Grand Wheat.
3 "		An early bearded variety.
9 "		Oats.
8 "		Corn.
1½ "		Potatoes.
1 "		Sorghum.
1½ "		Garden.
81 acres		In crop.

The remainder is unbroken and used for prairie hay and pasture. The farm is new, having been commenced five years since, and from its own products made the payments of the soil at five dollars per acre, and also the present improvements. Mr. A. is but an invalid, and capable of but little labor, but, with the aid of two small boys and hired hand, with his good management he has succeeded, even in the face of the hard times, of which we have heard no inconsiderable complaint during the years 1857-8-9, but during all of those poor seasons Mr. A.'s crops were good, most of which was due to his better mode of farming.

Culture of Spring Wheat.—So soon as the wheat is cured enough to stack, it is hauled from the field, and one of the boys put the team to the plow and stubble is at once turned under, and even now, at this early date, about one-third of the grain land has been turned over, while not over two-thirds of the whole is cut. It is astonishing how soon the seeds of weeds spring up after the grain is cut and the sun allowed free access to the soil, and so soon as they are well out of the ground Mr. A. deems the best time to turn them under with the stubble. The scattered grain at once springs up and gives him a good supply of the best fall feed for his stock, and in spring the land is in fine condition for corn, wheat or oats. His corn is innocent of weeds, and without further plowing is ready for spring wheat. The nine acres of oats will be followed with corn next season. He sows his spring wheat before the frost is all out of the ground, not waiting for the ground to become dry and settled. August plowing and March sowing are his essentials of success in the culture of spring wheat, and from his success we must admit that they are of no small value.

Oats are not to be sown so early, but the same system of plowing is to be observed. Oats will rot in the ground if sown too early, or when the ground is muddy, but not so of wheat. He sows

the Rio Grande considerable smut. Now, had the brine been strong and the skimming process thorough, neither of these would have been seen. There is no good reason to have either oats or smut in spring wheat while the remedy is so cheap and simple.

China Tea Wheat.—This is a beautiful variety of wheat, and gives promise of being the most valuable among our spring wheats. The heads are long and well filled, the straw bright and strong. We don't like its long beards any better than the Rio Grande, and it has the fault of shelling badly if left standing too long before cutting. But for its fine yield we shall make the Club give place to it next spring, and shall endeavor to cut it so early that we may not lose by its shelling propensity. Its quality for flour stands at the head of the list. It was said to have been taken from a chest of black tea some fifteen years since, by a gentleman in Rensalaer county, New York, who obtained some six or seven kernels at the time, and from which the present supply has been derived. We saw several fields of it in the neighborhood, and plenty of it can be had for seed at the price of other good seed wheat.

The Hot Wind.—We have before mentioned the effects of the two days of hot wind on the fruit trees near the lake shore. Here its effect was to rust the foliage of the wheat at the time of heading, and so serious was the injury to the leaves that most farmers despaired of a crop, and the common report was that the spring wheat crop of Northern Illinois was ruined by the rust, but the stem and head remained uninjured, and the result is a fair crop of wheat of an average quality. The yield will range from eight to fifteen bushels, while some fields, like these of Mr. Arnold, will probably reach twenty bushels per acre. Fruit and shade trees were injured at the same time; the heavy wind appeared to whip out the leaves like the wearing away of a calico flag, doing more damage from its force than from other causes. The orchard before noticed appeared to escape its bad effects, while the locust trees, thirty feet high, were pretty much denuded of the leaves.

Harvest Beer.—While in the harvest field, Mrs. A., at ten and again at four o'clock, sends out a lunch to the harvesters. Accompanying the lunch is a jug of what she calls harvest beer, and which we sampled several times during our stay, and for this style of weather found it very agreeable. It is made as follows: One gallon of water, a half pound of sugar, oil of spruce to flavor to taste, and a little yeast, shake it well and put in a jug and set in a cool place. In from six to twelve hours it is ready for use; it will keep about two days.

The Garden occupies one and a half acres, and is the best farm garden that we have seen thus far in our journeyings. Rhubarb, asparagus, onions, beets, peas, Lima beans and early potatoes were all in their glory. From these the boys had sold at the village to the amount of seventy-five dollars to this date, and that without

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having apparently lessened the stock. In a year or two more the long rows of small fruits will add to their income in no small way. For the first time, except in our own grounds, we find the Lima bean growing without poles, and the boys say they do quite as well. Other farmer boys will do well to make a note of this consoling fact, for it will save them no small amount of labor. The garden is arranged for working the long rows of vegetables and small fruits with a horse. Here we again met with large sized dwarf apple trees without fruit, while dwarf pears of the same age are bending beneath their loads. The Louise Bonne de Jersey, White Doyenne and Bartlett stand again at the head of the list. The Black Cap raspberry is a favorite, as it is in all prairie grounds where it has had a trial.

The fruit is much improved in size and quantity by cutting the canes back to within two feet of the ground during warm days in March. This will also save the trouble of stakes and strings, as they will need no tying up. In this way they are also less liable to drouth. They should be planted in rather moist land, not either too dry or too wet. The garden is protected by belts of locust.

The Orchard has been set but two or three years, and contains two hundred and twenty-five trees, to be reinforced with five hundred more next spring, which are now in the garden ready for the transfer. The Lombardy poplar is to be extensively used about the orchard to break off the winds.

The Stock consists of two span of horses and brood mares, three colts, four cows and twelve head of young cattle. The piggery is more extended in proportion, and contains fine specimens of a cross of Suffolk and Essex. They are all fed on meal, the slops from the house and refuse of the garden. The stable, sheds and tool house are cheap, yet efficient structures, waiting the development of the mine to present more ample buildings. The fences are of the class before noticed, with the addition of an abundant supply of good well made gates.

The front yard is well laid out, and filled with fruit, ornamental trees, shrubs and plants. To those who say they have no time to attend to these things, we will point to the well made walks, grass plats and flower beds of this farm house. The time will come, in fact is not distant, when, to be entitled to be a good farmer, there must be a good yard and garden as the first requirements of the creed. The side of the yard is flanked with twenty-five dwarf and the same number of standard pears, many of them loaded with fruit, but like all selections of pears, containing too great a proportion of poor varieties. A half dozen fine evergreens are not the least of the attractions in these grounds.

Mr. Arnold is a direct descendant of Roger Williams, of Quaker memory, and, like his progenitor, with Quaker proclivities. He believes in using brains as well as muscle in farming, and has de-

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monstrated their value. There is no overworking, no driving or fretting, but a steady perseverance, and to save as he goes. With a library well stored with useful books and a good supply of newspapers, himself and boys find ample time to read. Their home is beautiful and attractive, consequently the village store nor the village groggery have no attraction for them, and they will yet write their names in the history of the agricultural progress of the State.

When we take into consideration the limited means with which to operate this farm, we must award to Mr. Arnold and his industrious and intelligent family no small credit for the excellent condition in which it is now presented to the public, as a pattern farm. A half a dozen years hence, with like continued treatment, this will be one of the best farms in this part of the State. In farming, brains are an essential element, combined with industry and capital. The man who works the hardest is not the most successful in his calling, but the man who judiciously applies his labor. The farmer who puts up a pair of bars, through which he daily passes, has made an investment that will deduct no small amount of daily labor, which, if properly invested in the building of gates, would be well laid out. Poor tools, whether badly made or worn out, are poor investments, and are discarded by the intelligent farmer.

At two o'clock we took the train for Cottage Hill, to take a look at the large orchard of J. W. Wakeman, situated about one and a half miles northeast of the station. Mr. Wakeman was not at home, and his son Bradford, one of the most industrious and practical young orchardists in the State, showed us through the extensive grounds. The *hot wind*, before alluded to, did no small amount of damage to the cherry crop, and the fruit fell from the trees as though a hard frost had cut them loose from the foot-stalks. The cherry orchard is protected on the south and west by a heavy belt of locust and other transplanted forest trees, now twenty to thirty feet high, while the slope of the land is to the northeast. The trees are apparently perfectly sound and making a good growth, and next season we doubt not they will turn out hundreds of bushels of fruit.

Of late there appears some little confusion in regard to this cherry —the New York nurseries sending out a cherry called the Early May, and another called the Early Richmond, in most cases a different fruit. The May cherry in question is what is known in Ohio, Kentucky, Virginia, and throughout the West as the "May," "Early May," and sometimes, near Cincinnati, as "Early Richmond," while in New York the Early May of Downing, and in Northern Ohio, of Elliot, is an inferior fruit, and not worth cultivating with the May cherry in question. Downing correctly describes this cherry under the name of "Kentish," and as Early Richmond is a synonymous, it may sometimes be sent out under that name, but we presume as a synonym of the Early May of Downing, which has unfortunately got confounded with our now popular May cherry.

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The orchard is also in fine condition. Most of it was grafted standard hight, say three feet. The "hot wind" reduced the crop more seriously than that of the cherries. This orchard is one of the largest in the State, and is certainly one of the most vigorous and promising. Most of the soil, except near the house, is a clay loam, with a tenacious sub-soil rather retentive of moisture. Before setting the orchard, lands were so plowed that the dead furrows were made on the line of the trees; the next plowing reversed this, and the trees were set in a furrow opened by the plow over this dead furrow, and were mainly covered with the plow, sufficient earth having been thrown on to the roots with a spade to hold them in place; repeated plowings have thrown up a heavy ridge against the trees, and now there must be over a foot of earth above the original collar of the tree; below this the drainage was made good by the old dead furrow. The whole is to be mole drained between each row of trees. This may be called deep planting, but when we take into consideration that the trees have all made a vigorous growth, and show no signs of lagging, we may come to the conclusion that in well drained soil deep planting, if not the best, is certainly not the worst. In this case the dead furrows between the rows are at least two feet below the earth at the base of the trees, and as the slope is gradual it already affords good drainage. He now proposes to put the mole three feet below this dead furrow, which will make it an average of four feet. This will require about one hundred rods to the acre, and at a cost of, say ten dollars. When this is done we apprehend Mr. W. will have one of the best paying orchards in the State. As much has been said in regard to deep planting, we wish to recall to mind the previous preparations in regard to draining. In anything like low grounds, or those not having a good slope, we would recommend planting on the surface and throw successive furrows on to the trees, so as to obtain good drainage, but when the ground is underdrained would prefer the flat culture.

The grounds of Lieut. Gov. Hoffman adjoin those of Mr. W. on the east. Forest tree planting has been the Governor's hobby, and one that he has successfully rode, and his grounds wear the most inviting appearance just now, when shade is at a premium, with the thermometer at a hundred under these leafy treasures. A liberal sprinkling of evergreens has added much to the beauty of these extensive grounds.

Late in the evening we again took the train bound West, and about midnight arrived in the village of Oswego, on the beautiful Fox river. We were sent to the principal hotel, which is miserably kept by a man whose name we were determined to forget before dinner; but we fear the effect of the bad breakfast did not wear off until we sat at the bountiful board of Mrs. S. G. Minkler. To ride part of the night in such hot weather, to swelter the rest of it in a small room, just large enough for two bed , and then to be served

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with villainous coffee, tough steak, drenched with rancid butter, with a lump of the same to grease your sodden rolls, flanked with eggs fried in the same delectable stuff, is about enough to make even the pretty village of Oswego look as though seen through a smoky glass.

A drive of four miles brought us to the nursery and orchard of S. G. Minkler. The orchard contains fourteen hundred trees. The aspect is to the northwest, and protected on the north by the forest and also to a short distance to the south and west. The broken nature of the country along the left slope of the Fox river, tends also to aid in breaking off the winds from the south and west. The soil is a clay loam, though varying in character, but all highly charged with lime, this part of the country lying on the Niagara limestone belt. Fifteen of the trees have been set twenty years; they were seedlings and top-grafted; some of these trees are dead, and all showing signs of decay. This does not argue that top-grafted trees are longer lived than those root-grafted. Fifty of the trees have been set fifteen years and the remainder at intervals every year since. All of the sizeable trees had set full of fruit, but the "hot wind" come and a large part of the young fruit fell off. Last year he had a very full crop. Mr. M. does not like to give up the old Rhode Island Greening, and we must confess that in his soil the trees are fine and the fruit rather abundant, yet we could not recommend it on common prairie land. The Yellow Bell-flower is a favorite, nor can he see any difference in the value of root and top grafted trees, both of which he has had a long time in bearing. The Winesap, Minkler, Keswick Codlin, Duchess of Oldenberg, Early Harvest, Red June and Raules' Janet are especial favorites. The Red June is a small tree and can be set close. The Rambo is a little tender but would plant it if he had to replace the trees every dozen years. Smith's Cider is a prolific bearer and valuable; it is an excellent table apple, and from the word cider being attached to its name people have overlooked its value for both cooking and the table; Yellow Injestrie is very hardy and productive, but he thinks too small for market. We take the responsibility to say that for those without orchards this variety should not be omitted, for its early and abundant crops. Benoni and Mother are both first rate; the first named should be in even a small collection; Wagner highly valued; English Golden Russet and English Russet profitable; Baldwin all dead and of no value; Summer Queen and Early Pennock are also ranked among the staple varieties; Boston and American Golden Russet both too tender. Fameuse, Spitzenburg and Fall Pippin both shy bearers, but

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no great amount of fancy varieties are planted. He has tested a large number of varieties, many of which gave out in the winter of 1854–'5, and of course have been dropped. The Snow and Holland Pippin have not had a trial in his grounds. The trees are set two rods apart each way, and while young cropped to corn. Orcharding to Mr. M. has proved highly remunerative; his fruit is hand picked, and always commands a ready sale.

The Nursery.—In the nursery the trees are grown stocky and with low heads, say two or three feet. The varieties are mainly those above named.

The orchard and nursery are parts of a large farm which is carried on to good advantage. Mr. M. has one of the best barns in the State, and for sheep, pigs, horses, mules and neat stock is not easy to be beat. The day, though sending the mercury above a hundred in the shade, was pleasantly, though rather laboriously, spent in looking through his well kept grounds. As a farmer and orchardist Mr. M. is among the most successful; he has done much towards establishing the fact that an abundance of fruit can be furnished at a cheap rate and at the same time pay a good profit to the cultivator. A proper selection of varieties, aspect, shelter and good culture are required.

Muck for Manure.—Mr. M. has a large pond or muck hole lying near the grove and where his stock have an abundance of water. This muck is hauled to the up land and treated as manure by spreading, as hauled direct from the pond. It is found of equal value with manure, and for wheat and clover is of great value when applied as a top dressing. Throughout the Fox river valley there are hundreds of similar ponds, which, in time, will prove a mine of wealth to the wheat grower. At 12 o'clock at night we parted with Mr. Minkler at the Oswego station, and took the cars for a night ride. The Rock Island and C. B. & Q. railroads cross each other near Wyanet, and in going to Rock Island, instead of having a stopping place at the crossing, passengers must get out at Wyanet and take a mile drive in an omnibus to Pond creek, on the Rock Island road. All this is decidedly pleasant about 3 o'clock in the morning, especially when a thunder shower is just in the offing and ready to pour down on your devoted head. We do not know which of these roads is to blame for this contemptible arrangement, and we can only wish that they lose no small share of travel in consequence. Some railroads have yet to be taught that a course of policy that would ruin an individual will have the same effect on them. When we again visit Rock Island we shall endeavor to do so without crossing over to Pond creek—one experience of that kind is ample. We arrived at Rock Island in time for breakfast, and soon after had the pleasure of meeting our old friend, D. F. Kinney, accompanied by Mr. C. H. Stoddard, who had entered his pear orchard for the inspection of the committee. We should have

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observed that business detained Mr. Chase in Chicago, and that Mr. Hull and ourself now constituted the working part of the committee.

The bottom lands of the Mississippi at this point are not very wide, and we soon commenced ascending the bluffs that overlook the river, and a grand sight it is. You look up to Moline, the to be Lowell of the West, and above and below the beautiful scenery that make up the *tout ensemble* of the Father of Waters. The bridge over which, at no distant day, shall trundle the riches of the Orient—the beautiful island that lies so quiet in her repose may ere long resound to the clang of mighty forges, fashioning out the sinews of war, to guard the eagle of liberty; these were to us beautiful in their present and pleasant in their prospective.

The pear orchard of C. H. Stoddard is about three-fourths of a mile back from the bluff, on a nearly level plain of considerable extent. The soil is a whitish prairie drift, similar to the land in the basin of Egypt. They have here also suffered with the hot dry wind of the 14th and 15th June, doing damage to fruit and foliage. At this point it was followed by a frost on the 17th and several days of cold weather. Most of the trees were well set in fruit, but at that time it fell off rapidly.

The orchard contains one hundred and seven standard pears, six years set. The land has not been underdrained, and has been cropped to corn. The trees have made a remarkably fine growth. They are mostly White Doyenne, Bartlett and Stevens' Genessee. The Bartletts have a fair show of fruit, proving it as popular on its own stock as that of the quince. If no casualty should overtake this orchard it will soon produce hundreds of bushels of pears. It is the purpose of Mr. S. to tile-drain the orchard. Tile is made near by of the common brick, but as the demand increases the tile machines will come into use.

The committee would have awarded this orchard the second premium, but the requirements were for one hundred bearing trees, and as the number fell short in this respect, it of course was thrown out, but we take especial pleasure in calling attention to it, and would commend it highly. The truth is, standards must take the lead in all pear orchards for market purposes. Dwarfs may answer for the garden and as ornamental trees, but for a profitable thing are found wanting.

The nursery of D. F. Kinney is adjoining Mr. S. on the west. The plain was formerly covered with a light growth of timber, and in many places is yet standing, offering a very good protection to the orchard. In his fruit garden are a large number of dwarf apple trees six years set, and now presenting a good crop of fruit. This is the second place on timber land where we have met the dwarf apple doing well. The Duchess of Oldenburg is especially fine. Mr. K. complains of the Brown Thrush, which nests in his trees in large numbers and preys upon his fruit. We hear com-

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plaints of birds in all locations near the forest, but little or none on the prairie.

In the garden of Mr. Dailing we saw dwarf pears, eight years set, loaded with fruit, and two Flemish Beauty standards, but five years set, bending with their loads of beautiful fruit.

Port Byron, some eighteen miles up the river, was our next place of visit, and we parted with our Rock Island friends in the morning to visit that locality and had the pleasure to meet Mr. A. S. Coe at the depot with his carriage, ready to drive us to his farm, which is some four miles distant to the northeast.

The land near the river is very much broken, but from its ready access to the river market it had been settled at an early day. The ridges run at right angles to the river, and present the appearance of having been cut away by the slow process of heavy rains. The soil being quite sandy would seem to favor this idea. The orchard occupies the crest of two ridges and the slopes and space between them. The drainage, except near the bottom of the valley, is perfect, requiring no underdraining; in this respect it differs from the ordinary prairie soil. It is what might be called a warm, quick soil. The trees, for some forty acres of the orchard, were common root grafts, set eleven years ago in the nursery, and at two years reset in the orchard. The remainder have been set from time to time up to within the past two years, making in all seventy-five acres, which, at twenty-four feet apart, is seventy-five trees to the acre, or an aggregate of five thousand six hundred trees. To stand upon one of these fruit crowned hills and look down the long slope and up the opposing hill half a mile distant, and view the stately rows of the apple laden with fruit is worth a long distance of weary travel to see. The peculiar topography of the ground, the size and form of the trees, all lend their aid to charm the beholder. The sun, which had all day glowed like a furnace, was just setting behind the bluffs, to the west of the great river, as we drank in the inspiring scene—the last day of the week, which had been one of arduous trial, amid the blazing heat of the August sun, no wonder, half invalid as we are, that the day of rest, in the very temple of Pomona, was hailed with delight, as we stood among those sentinels of health and saw the light of day fade out into the night.

This orchard has been trained on the non-pruning system, and the trees branch from and near the ground. It has been but nine years set, yet it has produced thousands of dollars worth of fruit.

The Fire Blight.—As we approached the Mississippi river from the east, we saw specimens of the fire blight on the apple trees—first a faint tinging of the terminal shoots with the blackened foliage, and as we come into the valley it became more common and more destructive to the trees. Now and then a pear tree was like affected, and in the grounds of Mr. Coe we find some varieties seriously damaged, especially is this the case with Smith's Cider, by

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the way, otherwise one of the most desirable. The Black Vandevere that was extensively planted at an early day, is in a worse condition, but we can well spare it as it is a worthless fruit at the best.

The orchard was set with two year old trees branched at the ground, that is, root grafted trees that had never felt the knife after grafting them, were set twenty-four feet apart each way, with flat culture, and the ground cultivated in corn for the first five or six years, since then they have been sown to buckwheat and plowed shallow, say two and a half to three inches deep. The buckwheat is not harvested, it grows thin and rather sickly in the shade, but has a most excellent effect by keeping the soil open and porous, and serves as a mulch in winter. There has been no time lost by getting the trees up to form a head, and we may safely say that this nine year old orchard is as large now as it would have been at twelve, had the usual mode of pruing been adopted. Here, then, is a gain of three years, which in a country almost destitute of fruit, is an object of no small importance. Our State Horticultural Society has been for years discussing this subject of low heads, while most of the nurserymen, who have advocated it, have not had the courage to brave old opinions and grow their trees in this manner, but have continued to cater to public opinion for fear of compromising their sales. We talk of eastern grown whips that are peddled through the country, but we can assure these same peddlers that they can find thousands of these same whips grown here that will pass for eastern trees without the least suspicion. We have never, until this writing, been identified with the ultra low headed orchardists, but have advocated it so far that we could cultivate under the tree, but here is a proof of its value that cannot be denied or set at nought. It is true that with some varieties, such as Willow Twig, Winesap and Yellow Bellflower that send out their branches at the surface, are too low on account of spreading habit, and should have their lower branches about a foot from the ground, so as to allow of the more convenient gathering of the fruit, while the Rambo, English Russet and the more upright growers can be headed at the surface with impunity. We do not promise that we will not grow trees to suit the taste of our customers, but our own planting hereafter shall be on this plan. Trees thus grown are safely protected from high winds, for as the wind cannot get under their heads, the fruit is not thrown off as is usually the case, and in this orchard there are but few windfalls, though the trees, many of them, are bending to the ground with their loads of fruit. The same hot wind, so much complained of, severely lessened the crop on most but not all varieties.

Varieties.—The Winesap is one of the greatest favorites, but does not produce full crops every year, and this year is one of the least. Sweet Bough is a moderate bearer, but the fruit is fine—not

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on the whole considered profitable. The Early Harvest is also thrown out and its place occupied with White June, which is a rampant, upright grower, and produces good annual crops, while the Early Harvest bears alternate years moderate crops only. The Domine is also one of the best paying varieties, and with its long, slender leaves, quite ornamental. The Rambo, on dry ground, is valuable, but in low situations, worthless. The tree is tender, but with the Minkler, Mr. Coe would not part. He says it should never be root grafted, while Raules' Janet should always be root grafted. We have frequently observed that in top grafting Raules' Janet, that it makes a very slow growth, almost dwarfish in its habit, and this may account for it. As we shall soon give our views on root grafting, we will not pursue this subject further at this time. The Rhode Island Greening is of little value with him, although the soil is sandy. The blight is the drawback to Smith's Cider, which would otherwise stand among the best. Willow Twig is one of the most profitable; it is always hardy and productive. Red Astrachan, Early Pennock, Keswick Codlin and Duchess of Oldenburg are profitable summer varieties. White Winter Pearmain, Yellow Bellflower, Little Romanite and Swaar, all valuable for the winter.

About four miles to the southeast and more out upon the prairie, is the orchard of William C. Pearsal, an old and valued friend of the writer, and to whose grounds Mr. Coe had the kindness to drive the committee. The orchard covers eighty acres on the home farm of five hundred and forty acres; on another farm, a mile distant, ten acres are also planted to apple orchard—it will thus be seen that Mr. P. has an abiding faith in the value of fruit growing. The trees are part upon the low head and part standard high system, but Mr. P. does not hesitate to give a wide preference to the low heads. His favorite summer varieties are the Keswick Codlin, Early Pennock, Duchess of Oldenburg and Sweet June; for fall, Rambo, Fall Wine, Fallawater and Snow Apple; winter, Brabant Bellflower, Smith's Cider, though of late it has been seriously injured by the blight; Winesap, Willow Twig, White Winter Pearmain, Little Romanite, Yellow Bellflower, Domine and Maryland Queen. There are other varieties on trial that may prove equally valuable, but these have been so thoroughly tested that they have become favorites. Raules' Janet does not give Mr. P. satisfaction. Greening, Esopus Spitzenburg, Baldwin, and many others have failed and been discarded.

Pears.—Mr. Coe has not succeeded with the pear, while the trees planted by Mr. P. in well sheltered locations have done well, and at this time have a good show of fruit. Mr. P. says it is useless to plant pears without having them well protected from the wind. Bartlett, White Doyenne and Flemish Beauty do well, either as standard or dwarfs.

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Aspect.—A portion of the orchard was set on flat land, but most of the trees have either died or proved barren by frost, while those on the swells have done well. The soil is a sandy loam, with an open subsoil, requiring but little more than surface drainage. All this part of the land lying between the Rock and Meredosia rivers is more or less sandy or a sandy loam, and produces abundant crops of spring wheat and oats, and the farms are but a succession of fields of these cereals, now mostly in shock, with only now and then a piece of late oats uncut. On our return we passed a seedling orchard well loaded with fruit, but the quality is so poor that it is of little value, except for cider.

A Fruit Cave.—Mr. Coe had just completed a fruit cellar or cave, a description of which will be of interest to fruit growers. It is about thirty rods from the house on the northeast slope of the hill. The walls are of limestone, eighteen inches thick, and arched over with hammered stone, laid in mortar and cemented over; on the outside it is thirty-seven feet long, thirteen wide and sixteen high, to be divided into two stories, the lower one of which is sunk in the hill, the upper part is to be covered with earth, roof shapen, and turfed with blue grass. It stands in the midst of the orchard, and the large trees shelter it from the sun. It is well arranged for ventilation and cannot fail of being one of the most admirable places for the preservation of fruit. In one corner will be a bin of ice, which will add to its coolness.

Hogging Down.—Mr. Coe has a good opinion of the value of clover in the orchard, to be pastured with swine. The swine will give the surface a partial culture, and the clover roots, which are biennial, will add value to the soil by keeping it open, and by decay enrich it. They will also gather up all the early windfalls, many of which contain insects, and thus prove of benefit.

Preservation of Fruit.—The fruit is hand picked, and the summer and autumn apples taken to market in a spring wagon. The winter apples are put in barrels, the heads firmly pressed in and headed up. There is no sweating of the fruit before putting up, but it is picked when dry by hand, and put into the barrels at the tree, and a few holes bored for ventilation; these are drawn to the house on a *stone boat*, and left out under the shed until the weather begins to freeze too solid to plow, when the barrels are put into the cellar. In this manner they keep remarkably well with little trouble, and are seldom repacked for sale.

To Orchardists.—We most especially commend the practice of

scalding of the west side of the trunks in the sun, to make lodgment for borers; no sweeping off of the fruit by high winds; no long days of toilsome labor in pruning; no needless waste of time in balancing the heads; no spoiling of the fruit by its falling a long distance to the ground; no tedious efforts in picking; and, to crown all, we have an early fruitage and abundant crops. Let us hereafter throw aside the whips, or cut them back within a foot of the ground, to send out new heads, and plant only such varieties that have proved hardy and abundant bearers under ordinary exposure and culture. In such an orchard, belts of trees for protection are of value, but much less so than with high heads. As an evidence of this, we saw an orchard within two miles of Mr. Coe, well protected by locust belts, the trees had heads sufficiently high to drive a team under them, had been set several years longer, but yet it is not as productive, though the trees are very thrifty, taking into consideration their manner of treatment.

Quincy was our next point of visit, but the war played the dickens with the river travel, and it is now but a waste of waters, with only a semi-occasional steamer plowing its placid surface, we therefore retraced our steps by rail to the memorable "Pond Creek," and crossed over to the C. B. & Q. road at Wyanet, and at one o'clock in the morning of the 6th of August, arrived in Quincy, and put up at the Adams House.

Sorghum.—Nearly every farm in the west part of the State appears to have its acre of Sorghum, and we saw several mills and boiling houses, where it is worked up on the shares. From what we saw and heard of the extent of the planting, the west part of the State will nearly or quite supply the local demand for sirup the coming year. The crop is rather late like that of corn, but is well grown, and must turn out a good yield. As a general thing, the farmers understand its manufacture, and since the chemists have let them alone, will make a good article. Sugar making is yet in the distance, at least its profitable demonstration.

Broom Corn.—Immense crops of this was grown last season, and the price broke down so badly, carrying with it numerous growers, that this season very much less was planted, and we shall look for a brisk demand.

The Mississippi Bottom.—From Quincy our route led for nine miles along the river bottoms, the road running just under the high bluff that shuts out the prairie to the west. The heat was intense as we rode out of the city and under the shadow of those cliffs, clothed with the giants of the forest, and were met with the cool breeze that came up from the river; the birds made merry music as if enjoying the scene. The river is away to the far side of the wide sweep of the bottom land, now dotted with vast fields of corn, and of the new plowed stubble, now being prepared for winter wheat, for here winter wheat, year after year, is sown on

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the same ground, and from the appearance of the large stacks of grain, must produce abundantly. The lower lying portions of the bottom are yet in timber of the heaviest description. Some excellent springs burst out from the rocky bluffs, mostly in the sandstone shale, which has overlaid the lime. On our return in the afternoon, the scene had changed, the wind had ceased to come up from the river, the sun poured its fiercest heat unobstructed on our road, the dust rose on all sides and covered us as in a fog. The sweat poured from our horse, whose fastest gate was a slow walk. The birds had fled from the roadside, and nought looked pleasing, save the fresh springs as they gushed forth from their rocky beds to refresh the thirsty traveler and more than thirsty horse. The poetry of the morning had turned to dusty, dreary prose.

Ascending the bluffs, a drive of a mile brought us to the farm of Clark Chatten. This had formerly been heavy timber, when Mr. Chatten, fresh from Yankee land, with axe on shoulder, a quarter of a century since, entered its massive aisles of towering oak and maple, and commenced carving out a home for his young family. The small clearing and log house have given place to ample buildings, extensive out-houses and far reaching fields. The farm contains four hundred and eighty acres of cleared land, two hundred and fifty acres in winter wheat now in stack, forty acres of apple orchard, twelve to peach and six to pears, the remainder to corn, meadow and pasture. The whole is divided into fifteen fields, requiring fourteen miles of fence, all of which is of rails, laid in the worm form with stakes and riders, and bids defiance to brutes, while for man it is no small amount of labor to get over, as we had abundant opportunity to testify. The farm is mostly worked on shares by tenants, six of whom have houses for their accommodation. The soil is the greyish white drift, peculiar to the basin of Egypt.

Varieties of Wheat.—Mr. C. sows the Blue Stem and the May or Alabama, in about equal quantities. He estimates his crop this year at an average of thirty bushels per acre. Clover grows rank, and is extensively cultivated. Lime is being used, and promises to prove profitable, even in this lime soil, so Mr. C. thinks, and is making extensive arrangements for burning it on his own land, which, extending to the river bottom, affords fine lime-stone in the bluffs. We must confess that our own faith is weak in the experiment. In some of his fields he has sown winter wheat continually for over fifteen years, and now when the crop lags, we think a change to grass will prove more beneficial than lime. Mr. C. is a believer in the value of manure, and is careful to spread it upon his land, and as he has some twenty-eight head of horses and mules, one hundred of cattle, and a fine lot of hogs, he has no small amount of it to haul out. His fences, gates and buildings are all kept in good order and ready for use.

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It is doubtful if there is a farm in this State that returns a better net per centage to its owner than this one of Mr. Chatten. The tenants all make money, and as it is an object for them to remain, and as they cannot do this and neglect their duties, it becomes their interest to do their work in the best manner, and to take good care of the premises. Mr. C. is a man of iron constitution, of great practical ability, and by hard labor and careful management he has carved out one of the most valuable homesteads in the State. As a farmer he has few equals, while his orchards are among the most extensive and profitable in the Northwest.

The peach orchard is set eighteen feet each way; the trees are large and full of fruit, but have been badly injured by the late severe winters, and will not last more than a few years at the best, probably this is the last heavy crop that they will produce. They have been set seven years, and have proved very profitable.

The Peach Grub.—These have proved troublesome heretofore, but now Mr. C. has a remedy: hog manure, ashes and tobacco stems, each will drive out the grubs. He has purchased tobacco stems by the wagon load, put them at the roots of the tree in the spring, and no worm will trouble them. Hog manure put at the roots of the tree has the same effect. Tobacco being largely grown in the neighborhood, the stems are cheap, costing little more than the hauling.

Protection.—Though the farm is shut in by heavy walls of forest, yet so desirable is shelter from the wind, that Mr. C. is now making a tight board fence on the north and west side of his peach orchard, six feet high, to break off the wind.

Culture.—Along the rows of trees, three feet on each side, they are cultivated with a one-horse plow, while the intervening space of twelve feet is in clover, now being mown and used for hay. Next week he will begin to send his crop to market at Hannibal and Quincy, each equidistant ten miles; from these points dealers ship them east and north, mostly from Quincy by river.

The Apple Orchard.—The heads of most of his apple trees are four to six feet high, and in many cases show the effects of the sun on the west side of the trunks. The oldest part of the orchard has been set seventeen years, showing that during his early years of farm life, Mr. C. paid little attention to what is now his favorite pursuit, fruit growing. Some of these trees are a foot in diameter, with wide spreading tops, and look as though they might last a half a century yet. To within the past three years they have been cultivated in corn and other crops, but since then, simply plowed and harrowed two or three times during the season. The blight is somewhat prevalent on the apple, affecting most varieties more or less; it is also on the forest trees, especially along the ravines and edges of the clearing. On the pear it is quite destructive, and has nearly

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ruined the whole pear orchard. Trees six inches in diameter, loaded with fruit, were dying with it. Some dozen years since the same fire blight went through the country, and left but few pear trees in its pathway. As we have only met it along the Mississippi river, we hope it will not travel inland.

Varieties of Apple Cultivated.—American Golden Russet, good; Milam, good; White Bellflower, good; Early Strawberry, good; Sweet Butter, good; Maiden's Blush, good; Yellow Bellflower, good; Holland Pippin, good; Pennsylvania Red Streak, good; Grannywinkle, good; Early Harvest, good; Smith's Cider, good; Pryor's Red, good; Ohio Winter, good; Summer Queen, good; Raule's Janet, good; Vandevere, good; Baldwin, good; Sweet Paradise, good; Sweet Romanite, good; Peck's Peasant, good; G. W. Sweet, good; English Red Streak, cider, good; Jonathan, good; Red June, good; Yellow Newtown Pippin, best; Romanstem, best; Old Pearmain, best; Winesap, best; Virginia Greening, best; Willow Twig, best; Little Romanite, best; Boston Russet, worthless. What Mr. C. means by *best*, is the most profitable market sorts. It will be seen that he ranks Baldwin among his good sorts. He has but few summer varieties, and notwithstanding that Quincy is an important fruit market, yet it is poorly supplied with good summer apples, most of those now in market being the windfalls of winter varieties, and are sold at twenty to thirty cents a bushel to ship north, while good apples, such as early Harvest, readily bring seventy-five cents, and are scarce at that.

Preserving Fruit in Brine.—Mr. C. has succeeded well in preserving specimens of fruit in brine, especially of peaches. In some he has added a small quantity of alum, to a decided advantage. The fruits to be operated on should be just colored up, but not fully ripe, or at best not in first rate eating condition. The brine is made as strong as possible and the fruit placed in it in glass jars. If fully ripe the colors fade, while if just right the colors are set. It is probable that a few hours in a solution of alum will tend to set the colors.

In the evening we drove out four miles on the Warsaw road to the farm of Samuel B. Turner, and on the morning of the 7th, the committee was again full by the arrival of Mr. Chase.

A Farm of Eighty Acres:—The farm of Mr. Turner contains eighty acres, and fronts the Warsaw road, and is directly opposite that of K. K. Jones, who took the first premium for the best forty acre farm last year. The house is a fine two story brick, with well laid out grounds in front, in the usual style of suburban residences. The fault with these grounds is in the planting too large a proportion of deciduous trees, but they are not so closely planted that this defect cannot be remedied and conifers put in to fill up. The great feature of the place is its Osage hedges, which, with the ex-

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ception of some twenty rods of post and board, to cross a piece of low ground, is the fencing. They are well made, and proof against any and all descriptions of farm animals. It is handsomely trimmed in the obtuse conical form, which gives it an ample base, and at the same time exposes the leaves to the sun. The most of the fence is made with a single row of plants, but Mr. T. prefers two rows set alternately, thus: * * * * *. This gives at once a better base, but for farm purposes we doubt if it is better than a single line set four inches instead of two lines at eight inches, the same number of plants are used, and the cost of the setting about the same. Mr. Turner's hedges are all perfect, that is, there are no breaks in them, and but one place where a small dog could get through, and that was for the purpose of letting the ratters through into the next field. The fences are a perfect mass of verdure, armed with its bristling thorns concealed beneath the leaves, but ready, on the approach of an enemy, to dispute his passage. The hedge should be trimmed twice a year, the first in June and again in September or first of October, but never during a drought—this has reference to the full grown hedge. Mr. T. uses a short scythe; one man can trim a hundred rods a day on both sides, and do his work first rate. Trees should not stand in the fence line, especially when young, as the shade retards their growth. Along side of a timber belt it would be different, for there the hedge would have the sun during part of the day.

The Fields.—First is the house grounds well laid out and partially planted, with most of it in blue grass and clover lawn; to the south of this a clover pasture of five acres, and north of the house grounds is the horse pasture, in which is one hundred apple trees nine years set, but not remarkable as to growth or profit. A stiff blue grass sod is not as conducive to the growth of an orchard tree as might be. This orchard is to be broken up so soon as rain comes to soften the soil, which is now baked hard by drought, and to be sown to winter rye for pasture for the horses, and will permit a better growth of the trees; this will in turn be plowed under and sowed to timothy and clover. But as this orchard is neither planted in the right place or of profitable varieties, a new orchard has been set the past spring, two hundred and fifty trees, mostly winter varieties, at the distance of forty feet each way—a pretty

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trees. After planting, the trees were liberally mulched with coarse litter. In planting the corn an entire row was left out, for the benefit of the trees, thus to some extent preventing too much shade, while the trees are young. The trees have made a fine growth, and in a half dozen years will begin to make liberal returns. The remaining sixty-five acres are in one field, but is to be subdivided into two. The corn was worked with one of Prof. Turner's two-horse cultivators until the laying by, which was done with a common one-horse cultivator.

The Army Worm.—We heard complaints of this worm as far north as Rock Island, and here at Quincy every one has had sad experience with them; by being prompt with the ditching they were kept out of the corn, though they swept the timothy and blue grass meadows and pastures clean, and as Mr. Turner raises hay for the city market he was a large loser. He says that he had at least a thousand bushels of worms on his little farm, yet he kept them strictly to the grass land. The clover they would not eat, and the result is he will have a small supply of clover hay for his teams.

Clover Lays for Wheat.—Ten acres of his clover meadow as soon as cut was turned over for wheat, and will be again plowed before sowing. By the way, a part of this was left for experiment, and will be turned over the middle of this month and sown at once on the sod.

Oat Stubble for Winter Wheat.—The oat stubble had been turned over three inches deep to kill the young weeds and to rot the straw, it is to be plowed seven or eight inches deep and sown to winter wheat about the middle of September.

The Live Stock.—Seven head of horses, five of them brood mares, five colts, three cows and a fine lot of pigs make up the list. The brood mares do most of the work. Among the out-buildings is a good substantial granary and an ice house well filled, and whose cool blocks are highly acceptable this heated term. The grapery contains two hundred vines set to stakes six by twelve feet apart, but this is found too wide and is to be filled in three by six feet. Vines grow very rapidly in all this part of the State, and these are not an exception; they have a fine show of fruit for young vines. A liberal supply of the small fruits are set in the fruit garden. Mr. Turner is a young farmer, but he certainly shows that he knows how to manage a farm, and we can assure our readers that there are few as well regulated and profitable farms in the State as his. The main crop of this farm is hay for city use, but to produce good crops it has been rotated with the small grains and with corn. Winter wheat is sown on the sod as described; this is followed with oats, another crop of wheat and seeded down, where it lays in meadow a few years. But few, even large farms, pay as

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round a sum as this; at the same time, it allows its owner to live a gentleman. He has just work enough, with nothing to drive him, and nowhere have we seen an eighty acre farm in so good condition as this, or one that makes a more pleasant home, and at the same time more than pays its way. Mr. Turner is a pattern farmer, and has the good sense to be an independent farmer, making himself and family comfortable and happy. This is the opinion of two members of the committee, who award Mr. T. the first premium, but as there is no competition Mr. Chase dissents, and the committee agree that his reasons shall form a part of this report and be placed in this connection. The other members of the committee agree not to discuss the views of Mr. C., they are left for the action of the society and the readers of the report.

"CHICAGO, *January* 6, 1862.

Executive Board Illinois State Agricultural Society:

GENTLEMEN:—I beg leave to differ from my associates of the Committee on Farms, etc., as touching the award on Mr. Turner's eighty acre farm. In my opinion the outbuildings and inside fences are not sufficient to entitle it to a first class premium. Mr. Turner designs improving both—until then I would award it only a second premium. There are many farms in the State of equally good soil, well cultivated, etc., which have also the requisite amount of fences and outbuildings. It is no fault of ours that they were not entered, but I do not see how we can consistently award a first premium to a place which, for reasons assigned, holds as yet, a second rank.

Very respectfully, C. T. CHASE."

We spent one hour very agreeably with our old friend K. K. Jones, of the "Pines," and, without going into particulars, we must say that we were highly pleased and gratified with his success. He has demonstrated that a man need not be born on a farm to make a good farmer. Mr. J. is driving at the grapes and other small fruits with his usual energy, and the first attempt at a large orchard of the May cherry since leaving that of Mr. Wakeman, is on his grounds. He has some two hundred of the trees, making a fine growth among his fifteen feet corn, fed from his heaps of compost. He has dosed his small fruits and grapes with the same, and they are making a remarkable growth.

Our next call, though like the last, was unofficial, on our friend J. A. Stewart, of the Quincy nursery. Mr. Stewart was born a nurseryman, bred a nurseryman, and is a nurseryman and a horticulturist in every respect. His trees and plants exhibit these facts on every hand, and if there is twenty-five acres of nursery anywhere in the West better selected, better arranged and better cultivated we have not seen it. The varieties are selected in regard to this latitude and are valuable. The May cherry is largely cultivated, being the only variety found valuable thus far in this part of the State. Mr. S. is doing considerable in the way of grapes, and has selected the Delaware as his favorite. We must think that in some soils this grape does much better than in others. Here it grows nearly as strong as the Isabella. The vineyard contains a thousand vines of Delaware, Concord and Diana.

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Grafting the Grape.—Mr. S. has been very successful in grafting the grape, for which he uses the Clinton for a stock. The scions have on two to three buds; uses a waxed thread, but no wax otherwise; cleft grafts in all cases, and binds with the waxed thread; covers with earth. Delawares thus grafted had, at this time, made over twelve feet of new shoots, besides the laterals. He top dresses his grapes with leached ashes. Next spring he will add two thousand Delawares, grafted on Clinton, to his vineyard.

Strawberry.—Mr. S. sold one hundred bushels of strawberries the season just closed, mostly Wilson's Albany. It will thus be seen that he has some fruit-growing as well as some tree-growing proclivities.

Recipe for Horse Drooling.—As Mr. Turner makes a liberal use of clover, his horses are liable to be troubled with this disagreeable complaint. His remedy is to cut up "burdock" leaves and feed with his oats. On our return to the city, Mr. Chase parted company with us to visit Mr. Chatten, and as his business engagements would not permit of his presence with the committee only as stated.

The Close.—Our official visits were now closed, and with a half day's leisure before the time would expire when we could leave for home, we therefore accepted the kind offer of Mr. Turner to drive us about the city.

The Value of Horse Feed.—In consequence of the foray of the "army worm" on the hay crop, hay is selling at $8 per ton; oats, 14 cents per bushel, $8 per ton; corn, 15 cents per bushel, $4 40 per ton.

Our first visit was to the residence of Ex-Governor Wood. The Governor was absent at Springfield, but one of his sons kindly invited us to look through the new house and grounds. The house is a fine octagonal architecture, but on the whole, too much of a house—too aristocratic for a republican governor. Too much cut and hammered stone about the walks—too intensely ornamental. We turned to the shade of the giant chesnuts, for though only two feet in diameter, yet their great spreading heads, festooned with burs, give them the appearance of giants—young giants at least, and as they were planted within the present generation, they may yet become old giants in their time. Certainly no shade tree has pleased us like these, with their fine heads, glossy leaves and clustering burs they have no superiors in stately beauty, and when the autumn frosts shall loosen the foot-stalks of their leafy garniture, open the husk of the prickly burr and shower down the nut-brown fruit, we shall have a combination of the useful and beautiful that should induce us to more fully appreciate this valuable tree. From the top of the house we look far over into the State of Missouri. The white houses of the village of Palmyra are just visible through the blue ether that arises over the vast forests that belt in the river.

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Lagrange, up the river, presents its broken outline of bluffs and river bottom, amid the windings of the great river. The drought is burning up the vegetation in and around the city, and unless a timely rain should visit them, we would not like to predict the results.

We next called on Dr. Merrick at the north end of the city, and near to the bank of the river, on a bluff a hundred feet above the water. The Doctor has retired from active business, and is giving his attention to his garden. Leaf mould, leached ashes, and cow stable manure is being composted in large quantities for his grapes, trees and vegetables. The drought is beginning to be felt in his grounds, and the strawberry beds are the first to yield to its influence. His new seedling Union strawberry was badly parched up. This strawberry, the Doctor thinks, is bound to win. It is now three years old, and the past season, on a plat three by six yards, yielded ten quarts at a picking, every other day, during the season. The fruit is dark, red and glossy, of large size, stem long and upright, holding the fruit well off the ground. The Chickasaw grape, a new seedling of the Doctor's, is loaded with fruit and is the only grape in his grounds free from rot. We will here state that, commencing with the gardens at Centralia, the grapes were found rotting badly in every locality that we have visited, perhaps except those of Mr. Wilson, at Winetka, we do not recollect to have seen any rot on his vines. While all other varieties are rather seriously affected, the new seedling is not touched, even when they are side by side on the same trellis. Even the Delaware are to some extent damaged. This grape has not before been exempt, and why it should escape this season is a mystery that we cannot solve. The bunches of this grape are long and moderately well shouldered with round and very large berries. The leaf resembles the Isabella. The Doctor says it is a seedling of the wild grapes from the bluff, and was produced before there was any cultivated grape brought to the neighborhood, and has scouted the idea that it is any other than a seedling of the Mississippi wild grape. It is now eight years old. The wood is short jointed and of a peculiar color, differing widely from the Isabella, though, as we said before, the leaf is almost identical with it. Whether it will prove as valuable when sent out to other soils is yet to be proved. A long row of standard pears, nine years set, are loaded with fruit, in fact, this soil and climate appear suited to the pear, and with the exception of the fire blight, they appear to be as productive as the apple. In this row are Buerre Bosc, Winter Nelis, Bartlett, White Doyenne, Seckel, Andrews, Onondagua, Flemish Beauty, all free from blight and loaded with fruit. Of the Dwarf, Dix, and Beurre d'Amalis, were loaded also. Several varieties were badly blighted, and one large tree, six inches in diameter, had been cut down that day with the axe, killed to the ground with the blight. On the trellis were vines of the Delaware of this season's growth, fifteen feet long, in

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all respects a match for the Catawbas that are growing beside them. The plants are three year old layers. The climate here is not supposed to be well adapted to the Currant, but the Doctor's bushes are partially shaded and thoroughly mulched with corn stalks each autumn, and have produced crops equal to any at the north. The bushes are very vigorous. There can be no question as to the value of this kind of mulching. By putting it on thick, the weeds are kept down and the ground enriched. With shade and mulching, we know the currant will produce large crops in all parts of the State.

Homeward.—At seven o'clock the whistle gave the welcome sound for "off home!" It was the close of the three weeks of active, arduous duty, during the most heated term of the season; passing over nearly two thousand miles of rail, devoting but little time to sleep—and most of that on the cars at night—we might well be excused for wishing for a few days of quiet rest.

Personal.—Before this report was written, Mr. Hull joined the army, leaving the chairman, who had taken the notes, to write out the report. This the writer has faithfully attempted to perform, and he alone should be held responsible for any omissions or errors in this regard. Respectfully submitted.

M. L. DUNLAP,
WM. T. HULL,
C. T. CHASE.

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FIELD TRIAL OF HARVESTING IMPLEMENTS AND MACHINERY,

HELD NEAR DIXON, LEE COUNTY, ILLINOIS,

COMMENCING JULY 22, AND ENDING JULY 26, 1862.

REPORT OF EXECUTIVE COMMITTEE.

In May, 1854, near Jacksonville, Morgan county, the Executive Board of this Society held their first trial of farm implements. The machines proposed to be tried were corn planters and drills. Of the former class there were four entries—of the latter, none.

In July, 1854, at Bloomington, McLean county, was held the first trial of reapers and mowers— of the former there were three entries (all self-rakers)—of the latter there were five.

In July, 1857, near Salem, Marion county, was held the second trial of reapers and mowers. On this occasion there were five entries of reapers and four entries of mowers.

These comprise all the field tests of farm implements, except, perhaps, such as may be said to attend the usual "plowing matches" occurring during the annual exhibitions, which, prior to 1862, had been held under the supervision and direction of this society.

They had been followed by manifest benefits to the country. Exhibitors were not slow to observe that our farmers, with their vast fields for unobstructed tillage, must soon become their willing customers, nor were our intelligent farmers slow to recognize in them the benefactors who were to relieve their occupation from much of its toilsome drudgery.

There had been a growing disinclination in the minds of the members of the board to authorize the award of premiums to farm implements and machinery without actual trial, until at the February meeting of 1862, on motion of ex-president Brown, it was resolved that no more such awards should be made. It was moreover understood that the continued welfare of the agricultural interests of our State was never, since its history as a State began,

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so entirely dependent in the immediate future, on the abundance and excellence of farm labor-saving machinery as now. The condition of our country, rendering certain the early withdrawal of a large per cent. of farm labor from its wonted fields; the increasing demand both at home and abroad for agricultural products, all pointed directly and most clearly to the necessity of quickening in some way the energies of inventors to the improvement of this class of machinery.

It was believed that in no other manner could the board contribute to this end and attain the desired results so easily or so certainly, as by *bringing together* manufacturers, inventors and intelligent farmers in the harvest fields of the State to make and to witness a trial of the various harvesting implements and machines.

Whatever the value of the *awards themselves* might be to the public who purchase and use the implements, or to the successful exhibitors, the value of the *trial* to all the competitors, inventors, manufacturers and ultimately to the nation, was scarcely to be over estimated. In this regard it is gratifying to be able to state our anticipations are being fully realized.

As we are advised, there is scarcely a machine then tried, nearly perfect as many of them were, which is not being announced for the opening market of 1863, as having been in some important feature improved—a result traceable, as we have good reason to believe, to the new ideas brought out and the application of principles observed by inventors for the first time during the progress of the trial of 1862. These we regard as the *great compensating fruits* of the effort then made.

It is due alike to the public, to the competitors on that occasion, and to ourselves to say, that no member of the executive board is a scientific machinist; that no more weight of authority is claimed to attach to the awards we have made, than should properly and fairly attach to the honest, deliberate judgment of any similar body of practical farmers and business men who had been selected—one from each congressional district of this State, to form the executive board of our State Agricultural Society. The supposed difficulty of obtaining the services as awarding committee for such trial, of gentlemen possessing a scientific knowledge of the mechanical principles involved, thoroughly conversant in detail with the practical operation of machines of this class, and who should, at the [illegible] be entirely disinterested and unprejudiced, together

For the best combined Reaper and Mower	Diploma	and	$75
For the best Reaper	"	"	50
For the best Mower	"	"	50
For the best one-horse Mower	"	"	20
For the best Heading Machine	"	"	50
For the best Grain Binder, which can be readily attached to any ordinary Reaper	Medal.		

The response which followed, and the interest felt, will readily be inferred from the list of entries, as follows:

COMBINED REAPERS AND MOWERS.

1. Walter A. Wood, Hoosick Falls, New York, Self-Raker.
2. Walter A. Wood, Hoosick Falls, New York, Hand-Raker.
3. G. H. Rugg, Ottawa, Illinois, Hand-Raker.
4. Sheldon & Co., Auburn, New York, Hand-Raker.
5. E. Ball, Canton, Ohio, Hand-Raker.
6. Seymour, Morgan & Allen, Brockport, New York, Self-Raker.
7. C. H. McCormick & Bro., Chicago, Illinois, Self-Raker.
8. Cline, Seiberling & Hower, Doylestown, Ohio, Self-Deliverer.
9. D. M. Osborne & Co., Auburn, New York, Hand-Raker.
10. John P. Manny, Rockford, Illinois, Hand-Raker.
11. H. H. Taylor, Freeport, Illinois, Hand-Raker.
12. George S. Curtis, Chicago, Illinois, Hand-Raker.
13. George Easterly, Whitewater, Wisconsin, Hand-Raker.
14. Thomas H. Medell, Ottawa, Illinois, Hand-Raker.

INDEPENDENT REAPERS.

1. H. H. Taylor, Freeport, Illinois, Hand-Raker.
2. John P. Manny, Rockford, Illinois, Hand-Raker.
3. D. M. Osborne & Co., Auburn, New York, Hand-Raker.
4. Cline, Seiberling & Hower, Doylestown, Ohio, Self-Deliverer.
5. C. H. McCormick & Bro., Chicago, Illinois, Self-Raker.
6. E. Ball, Canton, Ohio, Hand-Raker.
7. Seymour, Morgan & Allen, Brockport, New York, Self-Raker.
8. W. A. Wood, Hoosick Falls, New York, Self-Raker.

INDEPENDENT MOWERS.

1. Sheldon & Co., Auburn, New York, Junior Mower.
2. Sheldon & Co., Auburn, New York, Senior Mower.
3. Walter A. Wood, Hoosick Falls, New York, two-wheel Mower.
4. Walter A. Wood, Hoosick Falls, New York, jointed bar Mower.
5. E. Ball, Canton, Ohio.
6. Cline, Seiberling & Hower, Doylestown, Ohio.
7. D. M. Osborne & Co., Auburn, New York.
8. John P. Manny, Rockford, Illinois, Senior Mower.
9. H. H. Taylor, Freeport, Illinois, Senior Mower.
10. George S. Curtis, Chicago, Illinois.
11. H. H. Taylor, Freeport, Illinois, Junior Mower.
12. John P. Manny, Rockford, Illinois, Junior Mower.

ONE-HORSE MOWERS.

1. Walter A. Wood, Hoosick Falls, New York.

HEADING MACHINES.

1. J. C. & C. N. Mayberry, Rockford, Illinois.
2. Barber, Hawley & Co., Pekin, Illinois, "Haines' Harvester."
3. G. H. Rugg, Ottawa, Illinois, was present with his machine, but did not compete.

GRAIN BINDERS.

1. W. W. Burson, Rockford, Illinois.

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Most of the foregoing entries were made sufficiently early in the season to indicate by the first of July the probable magnitude of the coming trial; and thus President Van Epps, whose residence is in Dixon, and who was charged with that duty, was enabled to make the most ample and perfect preliminary arrangements. We cannot but seek to impress on all who may be called upon to conduct a similar trial, the very great importance of attending to this first step. No detail is so minute as to be safely overlooked or purposely passed by. Nothing which can possibly be done before, should be left undone until after the commencement of the actual test. Any failure in this regard will surely be fatal to the smooth working and easy going of subsequent operations, and seriously interfere with the pleasure of the occasion.

As it is now the settled policy of this society, to award no premiums to implements except upon actual trial, we desire in this connection to urge upon exhibitors the necessity of being early and completely ready. Ship your machines in ample time to reach their destination, and be on the ground by yourselves or active agents, several days before the proposed trial. Secure your teams, and, if the machines are new, and have not been used, set them up, fit their various parts, and operate them. Bring with you duplicates at least, of all the minor pieces. If, by your inattention to these particulars or for any other reason you are not prepared for the ordeal, the committee may be compelled to award a premium to a machine inferior to the one you represent, and thus you inflict a double injury. Remember, too, that no reputation for excellence, however justly earned and well deserved, can be permitted to offset positive failure when actually competing; and that it is beyond the discretion of any committee to substitute for the short-comings of a competitor, any knowledge they may previously have acquired of the character and capabilities of his machine.

In the present instance, President Van Epps had secured two grass fields. The first was situated about one mile south of Dixon, and is owned by Charles Dement, Esq. There was growing upon it a beautiful crop of timothy grass, standing well, with a little admixture of red clover—the whole, as was subsequently ascertained, averaging quite two tons per acre.

The surface, which was as smooth as that of most Western meadows, was most elevated at the south end, and sloped gently and quite regularly to the north.

Across this slope, from east to west, thus rendering them nearly horizontal the longest way, twenty lots containing one acre each, four rods in width by forty rods in length, had been surveyed.

Three other lots of the same dimensions each, extending lengthwise from north to south, had been surveyed off adjoining and on the east of the first twenty; and four other lots, each having the same area had been surveyed in another portion of the field, on which was grass quite similar in variety and quality. The corners

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of each lot had been distinctly marked, and the lot numbered. The topography of the field and arrangement of the lots are well illustrated by the annexed sketch and diagram. A wide head-land on the west side, and a narrow way around the entire plat surveyed, had been cleared of grass. The second grass field was situated half a mile further to the south-west—was triangular in form and was thickly covered with a mixture of white clover, blue grass, common slough grass and upland prairie grass. No part of this field had been mowed the preceding year—the previous crop forming a thick bed of tangled, dry and tough grass, through which came up very luxuriantly the present year's crop. The surface of the ground in this field was, in general, gently undulating, intersected by two broad shallow ravines, the bottoms of which were soft, and, but for the sward upon them, would have been miry. Skirting these ravines, the surface was very uneven, abounding in hummocks from five to fifteen inches in hight.

The grain field selected comprised one hundred and sixty acres of spring wheat, owned by Mr. Moon, Col. Eyre and Mr. Moeller, and lying some three and a half miles west of Dixon. The surface of the ground cut over was quite even, though not level—there were no abrupt declivities. The grain, generally, stood up well, but in some places was lodged. The average yield of grain per acre was about twenty bushels.

Twenty-three lots, each containing one acre and eighty-four hundredths; three lots containing each three acres; and one lot containing five acres, had been surveyed, staked and numbered as before described when referring to the grass fields. [See diagram.]

On Monday, July 21st, the following members of the Board were present in Dixon: President Van Epps, Vice Presidents Rosenstiel, Mattson, Whiting, McConnell, Wait and Ozburn, and Ex-President Webster, as also the General Superintendent, Col. Horace Capron, and the Corresponding Secretary, John P. Reynolds. Vice President Holder arrived subsequently, and attended during a portion only of the trial. The Board assembled at the "Nachusa House," and entered at once upon a comparison of thoughts as to the best mode of procedure. Communications in writing, having reference to the conduct of the coming trial, were received from several of the expected competitors, and duly considered. The subject of a scale of points, as the basis upon which to make up the awards, had been well considered by every member prior to his arrival, and after a free interchange of opinion, it was

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1st—Quality of work—representing Perfection			40
2d—Simplicity of construction	"	"	10
3d—Durability	"	"	15
4th—Ease of draft	"	"	20
5th—Market price	"	"	5
6th—Facility of management	"	"	10
A perfect machine			100

In addition to these principal points, each of which must be considered in examining every reaping, mowing and heading machine, the following sub-points, which readily range themselves under one or the other of the foregoing, were carefully considered:

1. Weight of machine.
2. Adjustibility of cutting apparatus to different hights of stubble.
3. Portability.
4. Rapidity of action or length of time required to cut a given area.
5. Ease of putting in and out of gear.
6. Accessibility of parts for purposes of repairs, oiling, etc.
7. Convenience and safety of operator.
8. Facility of backing and turning.
9. Facility with which the size of gavel may be controlled by the driver.
10. Side draft.
11. Weight on horses' necks.

Still others found in the various scales which have been used and reports made, and others referred to in the communications from competitors, were brought to the attention of the members.

Each was furnished with a note book of ample dimensions, containing a complete list of entries, and scale of points, in which to record his impressions and observations on the field.

After the arrival of Mr. Holder it was devolved upon him to prepare a specific detailed description of each implement, giving special prominence to those parts and principles which distinguish it from all others.

The board met regularly every evening during the progress of the trial to discuss the work of the day and prepare programme for the following.

All being in readiness, on the morning of July 22d, those representing independent mowers were notified the trial would commence immediately in the field of timothy grass one mile south of the city.

There were fourteen entries in this class, but owing to breaks in railroads occasioned by recent unprecedented heavy rains, only six machines had arrived on the ground and were prepared to commence the trial. These were—

1. Wood's two-wheeled Mower.
2. Wood's jointed-bar Mower.
3. Ball's Ohio Mower.
4. Cline, Seberling & Hower's "Excelsior."
5. D. M. Osborne & Co.'s "Kirby."
6. George I. Curtis' "Cam" Mower.

The

The lines between the respective lots were indicated by the high stakes on the corners with flags flying, and the drivers were instructed to confine their horses and machines to their respective lots and in no event to trespass on those adjoining.

The machines placed, preparations were made to attach the Dynamometer and test the draught.

The instrument used is known as "Gibbs' Elliptical Dynamometer." It has been in possession of the society for seven years, has been used on various occasions, including a similar trial in 1857, is seemingly as perfect in its action, movement and vibration as any instrument of like construction can be; and, in our opinion, is not objectionable for want of reasonable accuracy when properly attached and its vibrations carefully noted by those accustomed to observe it. That it is entirely accurate or that it is more nearly so than any other, is not claimed. Vice president Whiting, assisted by ex-president Webster, was assigned to the duty of testing the draft of the various machines and they two did so throughout, in every instance.

A carpenter with the necessary tools was employed under their direction. No "tricks of the trade" such as buckling the breast straps unusually short, thus compelling the team to pull partly by the tongue, or elevating the sickle bar above the proper cutting point—were permitted to prevent a fair test. The observations of the instrument were made *on the first round when the sickle was necessarily and unavoidably cutting a full swath; and the conclusive indications* were taken, so far as could possibly be done, when the machines were on level ground at the same rate of speed—and meeting with like resistance from the standing grass.

On this *first swath* cut with the Dynamometer attached, was also determined the *hight of stubble and width of cut*, and it will therefore be readily seen that any undue elevation of the sickle to lighten the draft would, in that much detract from the merit of that particular machine in the quality of work.

The same method of determining the draft, the hight of stubble and width of cut was pursued throughout, except that in reaping, each machine was tested on a five acre lot, especially surveyed for that purpose, with a view to secure entire uniformity of surface and grain. After each machine had been once around its assigned lot, it was placed as at first. The driver was directed to start at a

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discharged throughout. The members of the committee were distributed over the field. The large crowd of visitors and anxious spectators were ranged along the headland on the west, overlooking the whole ground, and at a signal from the superintendent, the work began. A scene more inspiriting than that now presented can scarcely be imagined. The weather delightful—the air pure and unusually cool and bracing for the season—the landscape itself one of the most charming to be found in the beautiful valley of Rock River—the occasion one of the most deeply interesting and important in the history of industrial progress—the enthusiastic, excited crowd of spectators assembled to witness the peaceful strife among contestants for the honors of the harvest field—the eager and absorbed inventors, manufacturers and capitalists to whose ears the click of some favorite machine was but as the music of the mint—all conspired to make an impression on the minds of those present, not easily effaced.

Every machine, while in motion, was examined by the members of the committee. Notes were taken of every circumstance deemed necessary to aid in arriving at a correct decision. The lands were finished. The first day's operations concluded with the announcement that such other of the independent mowers, and all combined machines which were present and in readiness, would be tried in a similar manner, in the same field, on the following day, commencing at 8 o'clock, A. M.

The description we have thus given of proceedings, and the plan pursued for the first day, will answer substantially for every other, except the last. The same general mode of procedure was continued. The non-arrival of some of the machines, for causes before referred to, interfered to a limited extent with the regularity of the trial, but the efforts and wishes of the board being so promptly and heartily seconded by every exhibitor, they succeeded in testing all machines, in each class, in a manner at once uniform and satisfactory. On the 23d of July, all combined machines on the ground, and independent mowers not tested, were operated in the same field of timothy grass.

On the 24th and 25th, all combined reapers and mowers, independent reapers and heading machines were operated in the field of wheat—the first and second class cutting each one acre and eighty-four hundredths, and the heading machines cutting each three acres.

The attendance of visitors on these two days was probably larger

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required of others. This concluded, all combined reapers and mowers and independent mowers were taken to the triangular field of mixed grass, uneven surface and rough bottom before referred to.

No survey of the field had been made. A natural division, however, made by one of the ravines, served to designate the boundary between the two lots into which it was separated.

The right hand machines, (those, the cutting bars of which project to the right of the driver) were assigned to one lot, and the left hand machines, (those, the cutting bars of which project to the left of the driver) to the other, as follows:

RIGHT HAND MACHINES.

1. Walter A. Wood's Two-Wheel Mower.
2. Walter A. Wood's Jointed-Bar, Mower, accompanying his Self-Raker.
3. Walter A. Wood's Combined Hand-Raker.
4. E. Ball's Ohio Mower, being also his Combined Machine.
5. Sheldon & Co.'s Cayuga Chief, No. 2 (Junior) Mower.
6. Sheldon & Co.'s Cayuga Chief, Combined Machine.
7. H. H. Taylor's Buckeye (Junior) Mower.
8. H. H. Taylor's Buckeye Combined Machine.
9. D. M. Osborne & Co.'s Kirby, Independent Mower.
10. Seymour, Morgan & Allen's Combined Machine.

—

LEFT HAND MACHINES.

11. John P. Manny's Combined Machine (Senior Mower.)
12. John P. Manny's Independent Mower (Junior Mower.)
13. George S. Curtis' Combined Machine.
14. C. H. McCormick & Bro.'s Combined Machine.

—

A comparison of this list with the list of entries will show that the following machines were not present at this last, and, to an imperfect machine, the most troublesome test of its cutting powers.

COMBINED.

G. H. Rugg's.
Cline, Seiberling & Hower's "Excelsior."
George Easterly's.
Thomas H. Medell's.
D. M. Osborne & Co.'s "Kirby."

—

MOWERS.

Cline, Seiberling & Hower's Two-Horse Mower.

—

The machines were placed as above numbered, and were required to follow each other in that order, cutting "swath about"—the committee observing their operation, noting the quality of work, etc. At one point where the tangled, moist grass presented, perhaps, as much difficulty to the performance of good work as any machine is ever likely to encounter, each was required to come to a full stop, and, without backing in the least, to start again.

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Those which failed on this test are No. 2, Wood's jointed-bar mower. No. 7, H. H. Taylor's, Buckeye, jr. No. 8, H. H. Taylor's Buckeye, sen. No. 14, C. H. McCormick & Co.'s combined machine. These machines performed well in every other portion of the field.

Although the interest had been well sustained throughout the week, the excitement and enthusiasm culminated during this last half day. Few who were fortunate enough to be present will easily forget it, while to those who were not there no adequate impression can be conveyed.

At the conclusion of operations in this field, the combined machines were required to be taken to the public square in the city of Dixon, and there changed from mowers to reapers, in presence of the committee—the time required and number of persons performing the work, being noted.

This closed the trial proper. Subsequently the committee carefully examined the stubble on the timothy field, from which the crop had in the meantime been removed.

They had, also, witnessed the operation of Wood's one-horse mower on the first day, and of Burson's grain binder during the trial of the reapers. As there was no competition in either case they are noticed in the proper place.

The report of the committee appointed to examine the various implements in the miscellaneous class, is also appended.

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THE AWARDS.

At Peoria, on the 19th and 20th of August, the members of the board again met, and after comparison of memoranda, agreed on the following awards:

For the best Combined Reaper and Mower, to John P. Manny, of Rockford, Winnebago county, Illinois.....Diploma and $75
For best Independent Reaper, to Walter A. Wood, Hoosick Falls, New York, Self-Raker.....Diploma and $50
For the best Independent Mower, to E. Ball, of Canton, Ohio, "Ohio Mower,".....Diploma and $50
For the best Heading Machine, to Barber, Hawley & Co., Pekin, Illinois, "Haines' Harvester,".....Diploma and $50

Walter A. Wood's one-horse mower was highly commended as a machine of undoubted excellence in its class.

The tabulated statements which follow exhibit, as nearly as possible, the results at which the committee arrived from their notes and memoranda taken on the field.

Grading the machines according to the scale of points has been done by a careful estimate of all the circumstances attending the operation of each implement. It is scarcely necessary to state that the difference in point of general utility between several of the best, all things considered, was not very strongly marked. Each

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had warm friends among the members of the committee, as each has its circle of admirers among the public. The award of a premium to either is not and should not be regarded as implying serious objection to any other.

The members of the board desire to express here, now, their earnest and heart-felt thanks to each and every exhibitor on the occasion for the uniform courtesy and co-operation extended to them, and hope that all may meet again in a similar contest at no distant day.

We also extend to the representatives of those machines a cordial invitation to place them on exhibition at the State Fair, to be held at Decatur, commencing September 28, 1863.

To Col. Horace Capron, general superintendent and his assistant, Mr. Cropsey, and to Messrs. J. Crawford and J. C. Ayres, the surveyors, we also desire to acknowledge our obligations. To the citizens of Dixon and of Lee county generally, and especially to Messrs. Dement, Col. Eyre, Mr. Moon and Mr. Moeller, who kindly furnished the fields of grass and grain, we tender our warmest thanks.

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TABLE NO. I.

Combined Reaping and Mowing Machines in Grain.	Quality of work.....	Simplicity of construction.	Durability...	Ease of draft.	Price.....	Facility of management	Total.....
Representing perfection.....	40	10	15	20	5	10	100
1—Walter A. Wood's Self-Raker.....	39	10	12	14	4	8	87
2—Walter A. Wood's Hand-Raker.....	36	8	12	12	4	8	80
3—G. H. Rugg, " "	25	9	8	13	3	4	62
4—Sheldon & Co., " "	38	8	8	11	3	8	76
5—E. Ball, " "	36	8	10	11	3	8	76
6—Seymour, Morgan & Allen, Self-Raker.....	38	5	10	12	2	6	73
7—C. H. McCormick & Bro., " "	38	4	12	11	3	3	71
8—Cline, Seiberling & Hower, " "	33	8	8	10	3	6	73
9—D. M. Osborne & Co., Hand-Raker.....	35	6	8	12	3	4	68
10—John P. Manny, " "	39	9	14	16	5	10	93
11—H. H. Taylor, " "	37	8	10	10	3	6	74
12—George S. Curtis, " "	25	8	5	15	3	4	60
13—George Easterly,* " "	38	6	5	20	4	8	81

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TABLE NO. II.

Same Machines in grass.	Quality of work.....	Simplicity of construction	Durability...	Ease of draft.	Price.....	Facility of management	Total.....
Representing perfection.....	40	10	15	20	5	10	100
1—Walter A. Wood's Mowing Attachment* to Self-Raker.....	29	6	10	16	5	8	74
2—Walter A. Wood's Hand-Raker.....	29	6	10	15	5	8	73
3—G. H. Rugg,† " "	15	8	8	11	3	3	48
4—Sheldon & Co., " "	35	6	9	12	3	6	71
5—E. Ball, " "	35	8	10	14	3	8	78
6—Seymour, Morgan & Allen, Self-Raker.....	30	4	10	12	2	5	63
7—C. H. McCormick & Bro., " "	35	6	15	13	3	3	75
8—Cline, Seiberling & Hower, Self-Raker†.....	35	6	8	12	3	6	70
9—D. M. Osborne & Co., Hand-Raker†.....	30	8	10	16	3	4	71
10—John P. Manny, " "	40	8	14	16	5	8	91
11—H. H. Taylor, " "	35	8	10	12	3	8	76
12—George S. Curtis, " "	30	8	5	12	3	4	62
13—George Easterly,‡ " "	20	5	7	20	3	8	63
14—Thomas H. Medell† " "	10	2	3	7	3	2	27

*This is really an *independent mower*. †Not present at the trial in prairie grass. ‡Fig. "20," in column "Ease of Draft," *doubtful*.

TABLE NO. III.

Independent Reaping Machines.	Quality of work.....	Simplicity of construction	Durability...	Ease of draft.	Price.....	Facility of management	Total.....
Representing perfection.	40	10	15	20	5	10	100
1—H. H. Taylor, Hand-Raker.....	37	8	10	10	5	6	76
2—John P. Manny, Hand-Raker.....	39	9	12	16	5	10	91
3—D. M. Osborne & Co., Hand-Raker.....	35	6	8	12	3	4	68
4—Cline, Seiberling & Hower, Self-Deliverer.....	38	8	8	10	3	6	73
5—C. H. McCormick & Bro., Self-Raker.....	39	4	12	11	1	3	70
6—E. Ball, Hand-Raker.....	36	8	10	11	3	8	76
7—Seymour, Morgan & Allen, Self-Raker.....	38	5	10	12	3	6	74
8—Walter A. Wood, Self-Raker.....	40	10	12	15	5	10	92
9—Walter A. Wood, Hand-Raker...	36	8	12	15	4	8	83

TABLE NO. IV.

Heading Machines.	Quality of work.....	Simplicity of construction	Durability...	Ease of draft.	Price.....	Facility of management	Total.....
Representing pefection.....	40	10	15	20	5	10	100
1—J. C. & C. N. Mayberry.....	30	9	12	20	5	10	86
2—Barber, Hawley & Co.....	40	9	15	19	5	8	96

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TABLE NO. V.

Independent Mowing Machines.	Quality of work.....	Simplicity of construction	Durability...	Ease of draft.	Price.....	Facility of management	Total.....
Representing perfection.....	40	10	15	20	5	10	100
1—Sheldon & Co., Junior Cayuga Chief.....	38	6	9	15	3	8	79
2—Sheldon & Co., Senior Cayuga Chief.....	35	6	9	13	3	6	72
3—Walter A. Wood's Two-Wheel Mower.....	38	6	9	15	5	8	81
4—Walter A. Wood's Jointed-Bar Mower.....	35	6	9	13	5	8	76
5—E. Ball's Ohio Mower.....	40	9	10	14	5	10	88
6—Cline, Seiberling & Hower's Excelsior*.....	38	9	10	12	4	10	83
7—D. M. Osborne & Co.'s Kirby.....	36	6	8	15	5	8	78
8—John P. Manny, Senior Mower.....	38	9	10	16	5	9	87
9—H. H. Taylor's Buckeye, Junior.....	38	9	8	13	5	8	81
10—George S. Curtis.....	38	6	7	13	4	6	74
11—John P. Manny, Junior Mower.....	37	7	9	15	5	9	82

*Not present at trial in prairie grass.

TABLE NO. VI.

Showing width of cut and draft in grass and grain, of Combined Reapers and Mowers.	Width of cut in grass...		Width of cut in grain...		Draft in grass...	Draft in grain...
	ft.	in.	ft.	in.	lbs.	lbs.
1—Walter A. Wood's Mower, (sold with the Self-Raker to make up the Combined Machine,).....	4	2			200	
" Self-Raking Reaper, sold with Mower.....			5	4		260
2—Walter A. Wood's Hand-Raker.....	4	8	5		250	265
3—G. H. Rugg's Hand-Raker.....	6		6	6	375	335
4—Sheldon & Co.'s Hand-Raker, "Cayuga Chief,".....	4	8	5		300	320
5—E. Ball's Hand-Raker.....	4	6	6		250	325
6—Seymour, Morgan & Allen's Self-Raker.....	5		5		340	340
7—C. H. McCormick & Bros., Self-Raker.....	5	6	5	6	325	400
8—Cline, Seiberling & Hower's Rear-Deliverer "Excelsior,"	4	6	5	4	285	365
9—D. M. Osborne & Co.'s Hand-Raker, "Kirby,".....	5		5	4	290	340
10—John P. Manny's Hand-Raker.....	6		6		305	345
11—H. H. Taylor's Hand-Raker, Buckeye.....	5		5	9	305	340
12—Geo. S. Curtis' Hand-Raker.....	5	6	5	6	250	325
13—Geo. Easterly's Hand-Raker.....	5	6	5	6	235	325
14—Thomas H. Medell's Hand-Raker.....	5		5		500	350

TABLE NO. VII.

Showing width of cut and draft of Independent Reapers.	Width of cut in grass...		Width of cut in grain...		Draft in grass...	Draft in grain...
	ft.	in.	ft.	in.	lbs.	lbs.
1—H. H. Taylor's "Buckeye" Hand-Raker.....	.....		5	9	.....	365
2—John P. Manny's Hand-Raker.....	.....		6		.....	345
3—D. M. Osborne & Co.'s "Kirby" Hand-Raker.....	.....		5	2	.....	350
4—Cline, Seiberling & Hower's "Excelsior" Rear Deliverer.	.....		5	4	.....	325
5—C. H. McCormick & Bro.'s Self-Raker.....	.....		6		.....	475
6—E. Ball's Hand-Raker.....	.....		6		.....	325
7—Seymour, Morgan & Allen's Self-Raker.....	.....		5		.....	350
8—Walter A. Wood's Self-Raker.....	.....		5	8	.....	285
9—Walter A. Wood's Hand-Raker.....	.....		5		.....	275

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TABLE NO. VIII.

Showing width of cut and draft of Independent Mowers.	Width of cut.....		Draft.....
	ft.	in.	lbs.
1—Sheldon & Co.'s Cayuga Chief, Junior	4	4	215
2—Sheldon & Co.'s Cayuga Chief, Senior	4	8	230
3—Walter A. Wood, Two-Wheel Mower	4		200
4—Walter A. Wood, Jointed-Bar Mower	4	4	215
*5—E. Ball, Ohio Mower	4	6	260
6—Cline, Seiberling & Hower, Excelsior	4	5	275
7—D. M. Osborne & Co., Kirby	4		225
8—John P. Manny, Manny, Senior	6		305
9—H. H. Taylor, Buckeye, Senior	5		265
10—George S. Curtis	5	9	300
11—H. H. Taylor, Buckeye, Junior	4		245
12—John P. Manny, Manny, Junior	5		250

*Much the heaviest grass on the field, and mixed with ripe blue glass at the bottom.

TABLE NO. IX.

Showing width of cut and draft of Heading Machines.	Width of cut.....		Draft.....
	ft.	in.	lbs.
1—J. C. & C. N. Mayberry	10	2	400
2—Barber, Hawley & Co., Haines' Harvester	10	2	375

TABLE NO. X.

One-Horse Mower.	Width of cut.....		Draft.....
	ft.	in.	lbs.
Walter A. Wood	3	6	175

In the foregoing tables, Nos. 6, 7, 8, 9 and 10, the width of the cut, as measured on the stubble, and the number of pounds, as indicated by the dynamometer, are stated. In grading the draft of the various machines, as shown in the other tables, Nos. 1, 2, 3, 4 and 5, the committee have allowed for what they believed to be the actual difference in the resistance from the standing grass and inclination of surface, and other circumstances, positively encountered by the respective machines, when the observations of the dynamometer were taken.

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GENERAL REMARKS.

COMBINED MACHINES.

Of these there were, at least, eight, which may be safely classed as first-rate machines for general use. They are:

1. Wood's Hand-Raker.
2. Sheldon & Co.'s "Cayuga Chief."
3. Ball's "Ohio Reaper and Mower."
4. Seymour, Morgan & Allen's Self-Raker.
5. C. H. McCormick & Bro.'s Self-Raker.
6. D. M. Osborne & Co.'s "Kirby."
7. John P. Manny's Hand Raker.
8. H. H. Taylor's "Buckeye."

Wood's Self-Raker would certainly be found in this enumeration, but that we do not regard it as a TRUE "COMBINED" Machine. The Reaper and Mower are entirely and in every part distinct machines—not convertible in any sense; and, although often sold together, and thus made to perform the work of a "combined machine" of the first class, no single piece of either is necessary to the performance of its work by the other.

Of the remaining entries, each has its special points of excellence, as will appear from the tables; but in their present condition we do not deem either of them equal, in the aggregate, to either of those enumerated above.

INDEPENDENT REAPERS.

Of these there is not one which is not an honor to its inventor.

Of the Self-Rakers, we rank Wood's first, Seymour, Morgan & Allen's second, and C. H. McCormick & Bro.'s third.

The rake or fork of the Wood machine is attached near the base of the teeth or tines, to an endless chain, running in a groove in the platform or apron, and is carried close to the back of the sickle, seizing and compressing the cut grain near the butts of the straw, and carrying it off in good shaped gavels for binding. The revolving reel does not interfere with that near approach of the rake to the sickle bar, desirable in short straw.

In the Seymour, Morgan & Allen machine, the rake revolves, or rather describes a quarter circle—the rake head being about as long as the apron is wide, the gavels are swept off and are left lying over the whole width of cut.

In short straw, we are inclined to believe, this machine would not do so good work as the Wood's, though of this no trial was made. With both these machines the drivers can readily stay the movement of the rakes at pleasure, until the gavels contain the de-

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sired quantity of grain. As labor saving machines in the harvest field, they need but the addition of a practicable automaton binder to make the triumph complete.

The McCormick Self-Raker differs in principle from either of the preceding, and the raking contrivance is liable to serious objections.

1. It is a jointed elongation of one of the arms or bars of the reel, and to insure durability the machine must be made so heavy and cumbrous as to require four horses to operate it.

2. There is no provision made for "sizing the gavels." At each revolution of the reel a gavel is swept off, whether in light or heavy grain—a very objectionable feature, as every farmer well understands.

The machine of Cline, Seiberling & Hower, "The Excelsior," is a self-deliverer.

The principal objection to it seems to us to be that it delivers the grain in the rear, and thus in the return track of the horses on the following round. The cut grain must of necessity be taken up, bound and cast aside immediately after the machine has passed, which is often inconvenient, and with oats impracticable, or it is liable to be trampled upon and run over by the team, which could hardly be tolerated by the prudent farmer.

The remaining Independent Reapers are hand-rakers, and, in their class, certainly deserve a front rank.

—

INDEPENDENT MOWERS.

Of the eleven entries all did their work well, and but one—the "Excelsior"—failed to make its appearance on the last day in the prairie grass. We have no further distinctions to make than are shown by the preceding tables. Probably no equal number of first class mowers were ever before assembled in the same field. The figures in the tables show how near perfection, in the judgment of the Committee, American genius has arrived.

—

HEADERS.

In referring to these machines, we desire to make the following points—premising that the table (No. 4) shows that in grading the two machines which were tried, *quality of work determined the award.* On other points the two, in the aggregate, are equal.

1. The Committee believe that, in the operation of "heading" grain—that is, cutting off the heads with a small quantity of straw—much time is saved in gathering the crop, but that much of the value of the crop may be lost to the farmer unless every part of the operation of harvesting is well, carefully and thoroughly done.

2. It is doubtless true that grain left standing until sufficiently ripe and dry to cure well when properly stacked, may be harvested

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and put in the stack or rick securely at the rate of twenty acres per day by one Header, two wagons with beds or boxes constructed for the purpose, seven men and eight horses.

3. It is somewhat hazardous to permit grain to remain so long in the field; and if, from any cause, it has been so left, and the harvesting is done by a Header, the greatest care should be exercised both in the gathering and stacking; and the stacks, if not immediately threshed out, should be securely thatched with some material equal for that purpose to long prairie hay.

We are aware of the claim by some that grain may be cut by the Header and safely stacked after it, when as green as to be harvested in good condition by any other method. This may be possible, but does not seem to us at present practicable. Grain cut as "early" as many farmers prefer to cut it and stacked in bulk immediately from the field, in the manner usual with those harvesting with Headers, will surely become musty and deteriorated in quality; and, in our judgment, to avoid this result with such grain will demand preparations for ventilating the stacked grain, either by arrangement of barns or fixtures in the stack yard, which cannot, for the present, be profitably made.

4. Lodged grain is not so readily gathered by the Header as by the Reaper.

5. The two machines presented were probably the best of their class. The Haines' Harvester, represented by Messrs. Barber, Hawley & Co., Pekin, Illinois, performed its work admirably, taking the wheat clean, and the operators stacking it in a workmanlike manner. Time of cutting three acres, 87 minutes.

The Mayberry machine, represented by Messrs. J. C. and C. N. Mayberry, Rockford, Illinois, failed to exhibit work of the first quality. The cutting was not well done, and the stacking very badly. The time consumed in cutting the three acres was fifty-eight minutes. Quality of work seemed to be sacrificed to time.

Each machine cuts a swath ten feet, two inches wide.

—

ONE-HORSE MOWERS.

But a single machine was presented, "Wood's One-horse Mower."

At present there is probably no large demand in the West for machines of the capacity of this; and, until our large farms are subdivided, there is not likely to be. In the smaller meadows of the States lying east of us, and especially in those with uneven surface, or where the timber has been recently taken off, the stumps still remaining, this small and excellent machine will, we think, be found very serviceable. In the test it performed to our entire satisfaction, and although there was no competition, it is highly commended.

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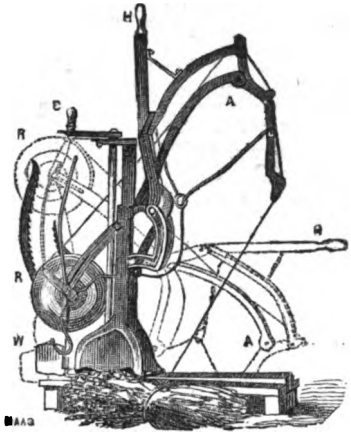

BURSON'S AMERICAN GRAIN BINDER.

This implement, though not regularly entered, was examined by the committee. It can be attached readily to any ordinary hand raking reaper, and with one man to operate it, will leave the grain substantially bound with wire as rapidly as horses ordinarily walk, while drawing a reaper. The remarks and descriptions of the machine, which follow, are from the inventors themselves, and we are willing to say that so far as we are enabled to judge correctly, they exaggerate little if any the excellence of the implement.

Although not yet perfect, we regard this as the most promising invention for binding grain by machinery we have observed.

Whoever has a distinct recollection of our western harvests prior to the introduction of the reaper, can appreciate how much that implement has done for the farmer, one item in the count being, that it has doubled the capacity for wheat growing in the west. From the time that the reaper has been brought to practical perfection in working, the binding has been the hard part of harvesting, and an implement that would perform this important labor has been anxiously looked for by intelligent agriculturists.

The first attempts at machine binding were made with the intention of using the straw for bands, and although some of them were very ingenious, yet the great dissimilarity in the band material, and the complicated machinery required, for making the difficult motions rendered all such binding devices practically useless. Some very ingenious attempts have been made to use twine and cord of different kinds of manufacture, yet the devices for tying a knot are necessarily complicated; also for twisting and tacking the ends, which would render useless an implement designed for general use among farmers. The liability for such bands to be eaten by crickets and grasshoppers in the field, and by mice and rats in the stack, is also thought to be objectionable. Still another objection

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to the use of twine is its cost, which, according to our estimate, is about double that of wire.

The introduction of wire as a band material marks a new era in harvesting—its extreme cheapness, amounting, at the usual price, to about twenty cents per acre. The simplest form of machinery fastens the band, being only a twist, while its durability is proof against all the causes which destroy other bands. All who have used them speak in praise of the manner in which the bands hold.

The cut represents Burson's American Grain Binder, which is placed upon the reaper platform in such position that the grain is shoved to it instead of being thrown upon the ground, enabling one man to bind the usual swath of the reaper. In the cut (the full lines show the mechanism in position to receive the gavel, the dotted position that of binding the sheaf) the reciprocating arm, A, moves upon its supports, and consists of four pieces, which we call, severally, the main arm, fore arm, handle piece and lever, receiving its peculiar motion by the lower end of the lever, moving in the irregular grooves in the uprights. The wire reel, R, is placed upon the rear extension of the main arm, and serves by its weight to counterbalance the weight of the arm. The curved ratchet rods act upon a ratchet pulley, placed upon a reel, which are so arranged that any desired tension may be placed upon the wire, which is drawn tight around a large or small sheaf. At the same time the wire is placed around the gavel, a cord, fastened near the end of the fore arm, is also thrown around the gavel, and by means of the weight, W, fastened thereon, any pressure can be brought upon the sheaf desired, thereby assisting the wire in drawing the sheaf tight.

In operating this Binder, it is placed upon any reaper platform (most platforms are extended for that purpose) in such position that the forker can most easily move the grain to it, when the binder, standing on that side of the implement next the butts of the grain, takes hold of the handle, H, and pushes it down, which puts the band around the gavel, then with the other hand he makes one revolution of the crank, C, which twists the ends of the band together, cuts the sheaf portion of the wire from the reel portion, and securely fastens the end of the wire. While the handle is being raised the sheaf drops off, which may be assisted by the foot, when the implement is ready for another sheaf.

The use of this implement has these, among other advantages:

1. The saving of about four-fifths the labor of binding, where the grain is thrown into the stubble.

2. Saving the greater part of the grain lost in the ordinary method of binding.

3. Relieving the farmer of much of that vexation which accompanies the hiring of a large number of hands in performing urgent work, where advantage is often taken of the farmer's necessities, and exorbitant prices demanded.

4. The grain bound with wire handles with less loss than in the

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common method, both in the field and in threshing, and the wire bands prove no detriment in threshing, as they are cut and run through the machine without injury to either the straw or grain.

Two of these binders were built and experimented with during the harvest of 1860; about twenty-five for the harvest of 1861; about two hundred were made and sold for the harvest of 1862.

This implement is the invention of W. W. Burson, of Rockford, and H. M. Burson, of Atkinson, Illinois.

MISCELLANEOUS.

An exhibition of farm implements and machinery, other than those to be tested by us, had been invited, and several inventors responded. The place designated was the Public Square in Dixon. The Executive Board, finding it impossible, without neglecting other important engagements, to make a personal examination of these implements, appointed a committee to attend to this business, who submitted the following report:

DIXON, ILL., *July* 28, 1862.

We, the undersigned, committee, appointed by the State Board of Agriculture of Illinois, have examined one of Michael's improved Indiana fanning mills, grain and seed separators, which was on exhibition by Hansel, Burr & Co., of Peoria, at the trial of reapers and mowers, held at Dixon, would respectfully report:

That we have examined the above named mill and seed separator, and have seen it operate in all the various branches of cleaning grain and seeds, such as separating oats and all other foul stuff from wheat, and also separating timothy seed from clover, cleaning them perfectly. We have tried it on time, and saw it clean Spring Wheat at the rate of seventy-five bushels per hour, and do good work. We can cheerfully recommend it to the public, and especially to farmers, as a good fanning mill, and the best seed separator that has ever come under our notice.

J. W. BECKER,
JOS. UTLEY.

DIXON, ILL., *July* 28, 1862.

We, the undersigned, committee, appointed by the State Board of Agriculture, have examined one of Clark & Utter's Horizontal Sugar Cane Crushers, made at Rockford, Illinois, which was on exhibition at the trial of reapers and mowers, held at Dixon, Illinois, under the supervision of the officers of the State Board, and

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would cheerfully recommend it as one of the best crushers that has ever come under our observation; would like to see it come into general use throughout the country.

JOSEPH UTLEY,
J. W. BECKER.

—

DIXON, ILL., *July* 28, 1862.

We, the undersigned, committee, appointed by the Board of Agriculture, also examined Cass & Baker's Automatic Scale, patented February 25th, 1862, a very simple yet ingenious construction, which weighs and registers the amount in its passage, controlling a continual stream, acting directly from the weight in the boxes, suspended side by side upon different weigh beams. The bottom of boxes, forming valves, are held in a closed position until the required amount passes into the box, the settling of which, as the balance is arrived at, releases the valve, which, by means of the weight of the grain thereon, instantly closes the opposite, changes the current, and indicates the amount with a simultaneous movement of the valves, not allowing a particle to escape without being weighed.

In grain elevating houses, used in loading vessels, canal boats and cars, or unloading the same, the advantages over other scales, in our opinion, are as follows: 1. Its rapidity. 2. It requires no weighman or tally-man. 3. There can be no mistake in adding or dividing, as upon the indicator the number of bushels are registered in a simple manner. 4. It controls a continual stream. Its use as an attachment to threshing machines saves one hand, delivers to the farmer his grain by weight instead of measure, the usual way. Also obviates all mistakes in keeping account of the number of bushels. With the farmer it answers the double purpose of scale and bagger. With millers and distillers it seems all indispensable, as it operates as well in meal, flour and shorts as in grain.

Various sized scales are constructed, adapted to each particular use.

JOSEPH UTLEY,
J. W. BECKER.

—

C. CORY'S IMPROVED EVAPORATOR.

DIXON, ILL., *July* 28, 1862.

The committee examined attentively this apparatus for the manufacture of our Northern sweets. The inventor and proprietor was in active attendance, explaining its several principles and mode of operation, and offering testimony to its performance. He claimed for it superior clarifying and cooking qualities, unusual speed and ease of management, together with much saving of fuel and labor.

In support of these points reference was made to the peculiar construction of the pan, and the adaptation of its several parts to their intended use. Samples, also, of sirups and sugars, taken from large quantities, and testified to as of pure extraction from the

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Chinese sugar cane, were also exhibited as the production of said evaporator. These were of the higher grades of sweets, in their unrefined stages, and indicated a degree of perfection but seldom, if ever, before reached.

The committee, after due examination, and free consultation together, have come to the unanimous conclusion that this said evaporator possesses, in a high degree, the essential properties claimed by the proprietor, and do hence in their decision rank it No. 1 on the list of Sorghum Evaporators, so far as exhibited at this collection of agricultural implements, or as otherwise brought under their observation.

JOSEPH UTLEY,
J. W. BECKER.

The committee on the miscellaneous class having failed to report upon several implements on exhibition, we append, by consent, the notes taken by the editor of the Prairie Farmer:

SORGHUM APPARATUS.

P. W. Gates & Co., of Chicago, showed one of their fire evaporators and a medium mill. With the evaporators, an iron furnace, front and grate bars, are sold, requiring only the brick work to complete the setting.

Mr. McFarlane, from Ottawa, presented the model of an evaporator for boiling sorghum juice, and he has a defecating vat of such construction that the heat can be carried through the center of the mass in pipes or underneath it, being regulated by dampers. It is drawn from these into the boilers, which are set a little lower. In his models his arrangement of flues and dampers is such as to give him very complete control of the heat, throwing it which way the operator may choose. The defecator or heater can be made and attached to almost any of the ordinary evaporators.

GRAIN DRILLS.

J. E. Youngman, of Rockford, showed his popular grain drill. He represents the feeling as decidedly increasing in favor of that way of putting in grain, and related several instances where the cost of the machine would be saved to the person using it over those who did not the present season.

CULTIVATORS.

Mr. Stafford, from Decatur, showed a sulky cultivator, for cultivating a row at a time, the frame being upon wheels, contains four standards, to which could be attached any desired form of tooth for cultivating corn at its different stages of growth; those on at the

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time were constructed to use either end up, one end being much wider than the other, and to throw the earth to or from the rows, they were changed from side to side. The teeth on each side of the row were connected together by a chain passing round a pulley at the forward end of the machine, the object of which was to allow a compensating motion; should one tooth come in contact with any serious obstruction, like a stone or root, this arrangement would allow the obstructed tooth to fall back and lift out of the way of the obstruction.

The machine was tried on Friday in a field of sugar cane, where it did very well; the direction of the machine is governed very evenly by the driver, with his foot, avoiding hills obstructions, etc.

—

STUBBLE PLOW.

A stubble plow, manufactured by John Dement, Esq., of Dixon, Illinois, was exhibited by him at work on the fourth day, and performed well. We hope, however, to have a more extended trial of this and of the Stafford cultivator, Youngman's grain drill and of the spading machine of Messrs. Comstock and Glidden, at the proposed trial of such implements in the fall of 1863.

—

THRESHER AND SEPARATOR.

H. A. Pitts & Co., of Chicago, exhibited one of their eight-horse power threshers and separators, of very fine finish. Their work compares with anything in that line, and the fact that nearly all of this class of machines now use such features as were originally patented to Mr. Pitts, is a decided compliment to them. Their manufactory, at Chicago, is a model one—everything completely systematic, and the work turned out of the best quality.

F. B. Hubbard, of Sterling, also exhibited an eight-horse separator, made in Ohio—Mr. H. being the western agent for it.

—

CORN SHELLERS.

James Vaughn, of Magnolia, Illinois, showed one of his power corn shellers. Mr. V. has been one of the most successful manufacturers of shellers in the State. The shelling is done between a cylinder and concave, not unlike a thresher in form, and is passed into a rotary sieve or screen, the outer center of which is provided with buckets, which bring up the shelled corn and deliver it at a spout on the side of the machine. A fan is so attached as to carry a current of air through the screen, and a cob elevator to carry away the cobs.

M. D. Gilman & Co., of Ottawa, also exhibited a power corn sheller. It was the Smith patent sheller, being provided with a shoe and fan to prepare the grain for market, as is needed in this

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country. This firm have spent much time and money in making these applications, and now feel confident they have a successful machine. They also showed a power for driving it.

—

A CHURN AND WASHING MACHINE

Were on exhibition, during the week, the latter by J. H. Youngman, of Rockford; the former exhibitor's name we have lost. This was a simple oblong box, divided in the center crosswise by a perforated partition. In one-half was a plunger or dasher, operated by a simple lever, one end of which was attached to a standard fast on the churn's side. The shaft of the dasher was hollow, and provided with a valve at the bottom. The operation was to carry down a quantity of air, which would rise through the cream, and, with the action of the dasher, give a greater agitation to the cream. The shaft being hollow and the dasher nearly tight, when the lever was raised the air would flow down through the shaft, to fill the space below, and when the lever pressed down the air was forced down among the cream. It is claimed that, especially for churning milk, it is very superior.

—

KNITTING MACHINES.

Mr. Bronson, of Chicago, showed the Aikin knitting machine, during the week, at the Nachusa House, where its wonderful action was admired by hundreds of people.

—

SPADING MACHINE.

Messrs. Comstock & Glidden, of Milwaukee, had given notice of being present with their machine. It was, however, delayed on its way there until Friday night; and as there was no ground near that where the mowing machines were used, suitable to try it, it was not operated.

—

BROAD-CAST SEEDING MACHINE.

T. A. Galt, of Sterling, showed a broad-cast seeding machine on wheels, sowing nine feet wide, designed for all kinds of grain and grass; price $50.

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THE UNIVERSAL CLOTHES WRINGER

Was shown, during the week, at the Nachusa House, attracting much attention—the operator running through anything, from a pair of delicate spectacles to a horse blanket.

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WINTER MEETING OF EXECUTIVE BOARD.

JANUARY 6, 1868.

PREMIUMS AWARDED.

ESSAYS.

Best approved Essay on the Cultivation of the Chinese and African Sugar Canes, the Expression of their Juice and its Manufacture into Sirup and Sugar, based on the practice of the author, with samples of seed of the varieties of the Cane referred to, and of the Sirup and Sugar, manufactured by the author. Premium to J. H. Smith, Quincy, Illinois. Diploma.

Best approved Essay, by a lady, on the Indoor Adornment of Home. Premium to Miss Mary E. Murtfeldt, of the "Farmer's Advocate," Chicago, Illinois. Diploma.

FIELD CROPS.

Best field spring wheat, twenty acres, special prize of E. Ball's Combined Reaper and Mower, awarded to Samuel W. Arnold, Cortland, DeKalb county, Illinois.

Second premium on spring wheat, not less than five acres, to same. Diploma.

SUGAR AND SIRUP.

For the best 20 lbs. Sorgho or Imphee Sugar, made upon Cook's Evaporator. Premium —A No. 4 Cook's Evaporator, offered by Messrs. Elymers, Bates & Day, awarded to H. R. Smith, Quincy, Adams county, Illinois, (Imphee.)

Best 10 pounds Sugar, being sample of at least 10 pounds, made by exhibitor from Imphee, the variety to be identified under oath, and sample of the cane and seed to be presented at the same time. J. H. Smith, Quincy, Illinois. Diploma.

Best 10 pounds Sugar, made from either the African or Chinese canes, or sugar beets. David Brown, Rushville, Illinois, Imphee. Diploma.

Best one gallon of Sirup, as sample of at least one barrel, made by exhibitor from Chinese sugar cane, without the use of clarifying or cleansing agents, other than fire and skimmer. C. D. Roberts, Jacksonville, Illinois. Diploma.

Best one gallon Sirup, as sample of at least one barrel, made by exhibitor, from the African or Imphee cane. Daniel Hutchinson, Rushville, Schuyler county, Illinois. $15.

On motion of A. B. McConnell, it was

Resolved, That the sample, one gallon of Imphee syrup, presented by E. S. Phelps, Jr., of Wyanet, Bureau county, Illinois, is the best sample of that variety on exhibition, but not having complied with the requirements in furnishing statements of manufacture, the premium is awarded as above.

There were several other samples of sugar and molasses exhibited, and the Board especially commended some twenty pounds of sugar shown by J. H. Smith, which he stated to have been made from cane which had been frozen and thawed previous to the expression of the juice. The color was a deeper yellow, and in granulation and freedom from waxiness it seemed at least equal to any on exhibition.

Also, sample of Imphee sugar, by Samuel Hooker, of Rushville, Illinois.

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It is believed the so-called "Otaheite" sugar cane, largely disseminated by Mr. Hooker, Mr. Scripps, and others, of Schuyler county, Illinois, is the variety of Imphee, the true name of which is *Oomseeana*, and as there is said to be a variety of the perennial sugar cane of the South known as the "Otaheite," it is perhaps best to drop that synonym. Other samples of both sugar and sirup were exhibited. The sugar from D. S. Pardee, of Rockford, Illinois, made from immature cane, and his statement of the process of freeing it from waxiness, were commended.

ORCHARDS.

Best peach orchard. Premium awarded to Dr. C. B. Pelton, of Makanda, Union county, Illinois. Diploma.

STATEMENTS OF FIELD CROPS, ETC.

STATEMENT OF S. W. ARNOLD.

FIELD CROPS.

Statement of S. W. Arnold, of the manner of Cultivation and Harvesting and Marketing of 6.19-100 acres of Spring Wheat, 55-100 of an acre of White Beans, 49.8-100 of an acre of Sweet Potatoes, and 26.7-100 of an acre of Onions.

The manner of cultivation, sowing and harvesting, variety of wheat, and cost of production and marketing, and the price obtained therefor, is the same, substantially, as in the affidavit pertaining to the crop raised on the 26.64-100 acres; and the number of bushels raised was one hundred and thirteen.

The land on which the White Beans was raised has produced six crops from the breaking—wheat, corn and potatoes; the crop immediately preceding the beans was spring wheat; soil dry, rather light for prairie, has a southern aspect; was plowed a short time before planting, dragged and rolled thoroughly; marked in rows fifteen inches apart, and dropped four beans in a hill; hills fifteen inches apart, as near as the dropper could guess, and covered lightly with a hoe; time of planting, 20th May; was hoed twice by hand, and pulled, stacked and threshed, in the ordinary manner, in September; yield, nine 40-60 bushels, about seven bushels of which were sold for $1 75 per bushel, and the remainder reserved for home use.

The land on which the Sweet Potatoes was raised was dry prairie, with southeastern aspect, sheltered on the west by a thick row of Lombardy poplars, and on the other three sides by Locust trees. The inclosure contains about one and a half acres; was manured slightly last year, plowed very deep in the spring, harrowed and rolled, back-furrowed with two horses and plow, throwing the land into ridges about three feet from center to center, top of the ridge smoothed off with a garden rake, and plants set 18 to 24 inches

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apart, from the 20th of May till the 20th of June; those set about the 10th of the latter month were the most thrifty and yielded the largest potatoes; plants raised in hot-bed; potatoes bedded 14th of April. The yield, in bushels, I am not able to state, as they were dug and marketed a few bushels at a time, from the fore part of September till November. The amount received for those marketed was $50 89. They were sold, about one-half for $1 25 per bushel, the other half at $1 per bushel, except five bushels sold to one man, at 75 cents per bushel. They were used once, twice and thrice a day in a family of eight to twelve persons, from the first part of September till about the middle of November; amount used in family not less than eight bushels. The cultivation was, twice working between the rows with horse and shovel plow, and thrice hoeing by hand, and once lifting the vines with a pitchfork. The whole amount of labor bestowed on the cultivation and harvesting about equal to 18 days of one man, at 75 cents per day, $13 50, and 4,000 plants, worth $2 per thousand, $8 00.

The land on which the 26.7-100 acre of Onions was raised has been used five years for a vegetable garden, and manured with barn yard and horse stable manure to a considerable extent each year. Land plowed in the spring, and mostly set with the top-onion sets; about one quarter planted with black seeds of red, white and yellow. The produce of all these were superior in quantity and quality to those raised from sets. The Onions were pulled for market as soon as they had began to form new bottoms. The cultivation consisted in four times hoeing and once weeding by hand, equal to about 18 days work of one man, including the preparation of the ground before planting and the planting, at 75 cents per day, $13 50. The planting was performed about the first of April; the rows were fifteen inches apart, and the sets put from three to six inches apart; and those from the seed thinned to four inches apart. The amount received for those sold in the summer was $9 15. Forty bushels were marketed in Chicago, early, yielding $16, ten bushels selected for seed and home use, worth 75 cents per bushel, and two bushels of sets for seed, worth $1 50 per bushel. Total value of crop $35 65. One portion of the land was where a hot bed had been the previous year, and the manure left and plowed in. The onions on that place were much the largest.

S. W. ARNOLD.

DeKalb County, ss.

S. W. Arnold, being duly sworn, says that he raised a crop of Spring Wheat the past season, upon land surveyed by Daniel W. Lamb, and that the quantity grown thereon was one hundred and thirteen bushels, measured in a sealed half bushel, and that he was assisted in harvesting and measuring said crop by Charles M. Downs, G. L. Arnold and Irwin Arnold; that the statement annexed, subscribed by this deponent, as to the manner of cultivation, expense, etc., is, in all respects, true, to the best of his knowledge and belief; and the sample of grain exhibited is a fair average sample of the whole crop; also, that he raised a crop of White Beans, a crop of Sweet Potatoes, and a crop of Onions, upon the lots of land surveyed by the said Daniel W. Lamb, and that they were harvested and disposed of in the manner set forth in his statements, made above, and that he was assisted in the harvesting, measuring and marketing of the said crops by Charles M. Downs,

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G. L. Arnold and Irwin Arnold, and that the statements annexed, subscribed by this deponent, as to the manner of cultivation, expense, etc., is, in all respects, true, to the best of his knowledge and belief, and the samples exhibited are fair average samples of the whole crop.

S. W. ARNOLD.

Sworn to before me this 11th day of December, 1862.

ABRAM CONANT, J. P.

DeKalb County, ss.

Charles M. Downs, G. L. Arnold, and Irwin Arnold, being duly sworn, say they assisted S. W. Arnold in harvesting, getting out and measuring his crop of wheat, referred to in the above affidavit, and that the quantity of wheat was one hundred and thirteen bushels, and was grown upon said ground, as stated in the affidavit of S. W. Arnold.

G. L. ARNOLD,
I. R. ARNOLD,
C. M. DOWNS.

Sworn to before me this 2d day of December, 1862.

ABRAM CONANT, J. P.

STATEMENT OF C. B. PELTON.

PEACH ORCHARD.

That portion of the State of Illinois lying south of Big Muddy river, along the line of the Illinois Central Railroad, is heavily timbered, and is crossed some three miles below Carbondale, in Jackson county, by the Grand Tower chain of hills, which runs across the State from the Ohio river to the Mississippi. These hills, in Jackson and Union counties, often rise several hundred feet above the level of the last named river. On their tops and sides the seedling peach tree probably flourishes better and is longer lived than in any other portion of the United States. The fruit, too, is more highly colored than I have seen elsewhere. Peach trees from thirty to fifty years of age, still bearing, are found in Union county. One of these, a common seedling free-stone, said to be above thirty years old, stands ten paces from my dwelling house. It measured, last summer, forty-six feet from the end of its extreme branches, and girths five feet three inches, one foot from the ground. It has borne several crops within the last six years; but that of the present year was so enormous that many of its branches were broken off, and its symmetry is sadly marred.

Whether the fine budded varieties will live as long here in a productive state, remains to be proved. Seedling trees bear five years out of six, in favorable localities; budded trees may not do quite so well.

I. My farm of 110 acres lies in sections 10 and 11 of township 11 south, of range 1 west, in Union county, and within a mile and a quarter of the Illinois Central Railroad, in latitude 37½ deg., which is that of Richmond, Virginia.

My peach orchard, of 2,230 trees, is situated on a spur of one of the ridges of the Grand Tower chain, running off to the northwest, and the land inclines mainly in that direction. The surface drainage is perfect. Probably not one square rod that is level can be found in my orchard.

II. The number of acres in orchard is about 21.

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III. The following are the varieties grown by me, set down in the order in which they began to ripen this year:

1.	Early Tillotson	July 14.
2.	Troth's Early Red	" "
3.	Serrate Early York	" 18.
4.	Cole's Early Red	" 22.
5.	Early Crawford	About the 25th July.
6.	Large Early York	" " " "
7.	Red Rareripe	" " " "
8.	Yellow Rareripe	" " " "
9.	Bergen's Yellow	" " " "
10.	Clinton	" " " "
11.	Cooledge's Favorite	" " " "
12.	Honest John (of the west,)	" " " "
13.	Bellegarde	July 30.
14.	George the Fourth? from Cincinnati	" 30.
15.	Oldmixon Cling	August 10.
16.	Nivette	" "
17.	Magnum Bonum	" "
18.	Harker's Seedling	" "
19.	Late Crawford	" 15.
20.	Ward's Late Free	" "
21.	Heath Freestone	" "
22.	Late Red Rareripe	" "
23.	Willow Peach	" 20.
24.	Fox's Seedling	August 22.
25.	Columbia	" "
26.	Lagrange	September 1.
27.	Heath Cling	" "
28.	Smock Freestone	" 8.
29.	Delaware White	" 10.

The following varieties have not yet fruited with me:

30. Haines' Early Red.
31. Morris White.
32. Monstrous of Douay.
33. Noble's Cling.
34. Stump the World.
35. Grosse Mignonne.
36. George the Fourth, from Rochester, New York.

IV. The product sent to market and sold at our station, Makanda, of the seventeen five year old trees, and the eight hundred three year olds, with a few two year olds, was 2,460 boxes, or about 1,025 bushels, which sold for $2,712 60. After paying express charges and commissions and hired help, and the cost of boxes, the net proceeds of the crop was about $1,750, or more than $200 per acre for some eight and a half acres gathered from.

V. My land rests on sandstone, which crops out in some portions of it. The soil is the black vegetable mould of heavily timbered lands; the subsoil is a reddish, yellow clay, with a plentiful admixture of sand. When I moved on the farm in March, 1857, much of the cleared part was occupied with girdled trees, left standing by the former owner. The burning of these on the ground furnished the land with a sufficiency of lime and potash for several years. Two crops of corn on a part of the land first set with trees, and one crop on another part were all that had been grown on it since it was cleared. The younger portion of my trees is on older land adjoining, which had been in cultivation —— years, and bore a crop of wheat in 1857, followed by corn in 1858 and 1859.

VI. Seventeen trees were planted in 1857, about eight hundred in 1859, one thousand two hundred and thirteen in 1860, and two

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hundred in 1862, in holes two and a half to three feet wide and eighteen to twenty inches deep. Distance apart, twenty feet each way. This is close enough on rich land in Union county; for, when loaded with fruit, last summer, the branches of several of my three year old trees, (three years old in the spring of 1862,) overlapped. Corn is then grown for two years—the first year four rows, the second year three rows, between two rows of trees. The third year the ground is not cultivated in order to check the growth of the trees and to throw them into bearing.

My trees are generally headed very low, some starting from the ground, with three or four main branches, others with stems from one to four feet high. They are mostly pruned into the vase form, by cutting out the leading shoot, and forming the head by the side branches. The borer is cut out spring and fall. The earth is removed from the collar of the tree, partly with the hoe and partly with a small wooden paddle, to avoid wounding the bark, and the worm is followed to his lodging with a curved metal or a straight wooden probe. The use of a probe made of whalebone or hickory often expedites the work considerably, as one can cut down upon it without dulling the knife.

We have another worm here infesting the peach tree, which I have never seen described. It is from a half to three-quarters of an inch long, and the thickness of a sewing thread, white, with two brown bars on the back, near the head. These bars are only seen under a magnifier. My sons and I call them "The Thread Worm," for want of a better name.

Unlike the borers, each of which has its own burrow, these worms are found in numbers together, dozens, scores, and sometimes near a hundred attacking a tree below the surface of the ground.

They are not "cut out," but pulled out of a broad, shallow hole, often twisted together, as the common earth worms are sometimes found. Indeed, they might readily be taken for young earth worms by a careless observer. After clearing the tree of them, we apply lime or ashes, or a mixture of both, which destroys any we may have overlooked. I think them more injurious to trees over two years old than the borer.

During the fruit season we let our pigs and shoats run in the orchard, while the hogs are fed outside on wormy, rejected peaches, bushels of which are thrown over the fence to them whenever we are engaged in picking.

The curculio assists in thinning our fruit for us, though, in our judgment, with no particular regard to our interests, puncturing too many specimens on trees that bear thinly, and too few on those that bear too full. Gladly would we dispense with her services altogether, but—"it takes *two* to make a bargain." So far we have relied mainly on swine as allies in the war against "the little Turk."

All my trees, except those set out last spring, received one plowing and harrowing in May; those excepted grew among corn, and had four plowings and two hoeings during the season.

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VII. The fruit, packed in scant half bushel boxes, was sent by express on the Illinois Central, mainly to Chicago.

Had time permitted, I intended to make some remarks on the several varieties fruited by me, and to give my reasons for retaining some and rejecting others in an orchard for profit. This may be done hereafter, if desired. The best I can now do is to indicate such and so many as I should plant, if forming a new orchard:

1. Early Tillotson,
2. Troth's Early Red,
3. Early Crawford,
4. Large Early York,
5. Bellegarde,
6. Oldmixon Free,*
7. Nivette,
8. Late Crawford,
9. Ward's Late Free,
10. Heath Freestone,
11. Fox's Seedling,
12. LaGrange,
13. Heath Cling,
14. Smock Freestone,
15. Delaware White.

*Not yet fruited by me, but would risk it.

CHARLES B. PELTON.

ORCHARD HILL, UNION COUNTY, ILLINOIS, *December* 31, 1862.

Jackson County, ss.

I, Charles B. Pelton, being duly sworn, do declare that the statements above made by me are true, to the best of my knowledge and belief. CHARLES B. PELTON.

Sworn to before me, this 2d day of January, 1863. JOHN RENDLEMAN, *Justice.*

SUPPLEMENT TO MY FORMER STATEMENT.

The following peaches I would reject for the reasons stated:

1. Serrate Early York—The fruit rots badly, is much eaten by insects when ripening, and the leaves and young shoots mildew. It is not so early or so large as Troth's Early Red.

2. Cole's Early Red—Fruit too small, and flavor not extra.

3. Red Rareripe—Bears well, but mildews and rots badly.

4. Bergen's Yellow—A most beautiful and excellent peach, but the poorest bearer in my orchard.

5. Clinton—Overbears; the fruit is too small and of inferior quality.

6. Cooledge's Favorite—A very pretty and good peach, but too small to sell with Early Crawford and other large peaches that ripen with it.

7. Late Red Rareripe—Has not borne well with me.

8. White Blossomed Incomparable or Willow Peach—A big name for a white peach of little merit in our locality.

9. George the Fourth—I have three trees under this name from Cincinnati, Ohio. For two years past they have borne *very moderate* crops, but I have failed to find in the fruit "the highest flavor" spoken of by Downing and others. It may be that the variety is removed too far south to "do its best," or a mistake may have been made in the name, though the leaves and fruit answer the description, except as to the quality of the latter. At any rate, the variety I have fruited under this name is not an excellent or profitable peach. I have trees from Rochester, New York, which will bear next year, and shall then be able to decide this matter.

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10. Oldmixon Cling—A first rate fruit; but clings do not sell as well as freestones in the Northern markets.

11. Harker's Seedling—Not so good as Nivette.

12. Magnum Bonum—Same remark.

13, 14. As to Honest John and Columbia, they are good; but I throw them out in order to lessen the number of varieties.

A list of Peaches most profitable with me:

1. Early Tillotson—Began to ripen, July 14. Does well here, but mildews some, and, as an orchard tree, is inferior to

2. Troth's Early Red—A few peaches ripe July 14. Tree a fine grower and bearer. The most profitable variety.

3. Early Crawford—Bearing variable—large and small peaches on the same tree. Not a good crop this year, but some specimens were superb.

4. Yellow Rareripe—Have but few specimens of fruit, my trees being but two years old, but it promises well. The Reyboulds, of Delaware, the most extensive peach growers in the world, cultivate this variety, instead of the Early Crawford.

5. Large Early York—A first class peach, but bore too full this year.

6. Bellegarde—A large, high colored peach of the highest flavor. Bears about full enough without thinning the fruit. I got it under the name of Grosse Mignonne.

7. Nivette—A finer fruit than Magnum Bonum or Harker's Seedling.

8. Late Crawford—Same remarks as about Early Crawford.

9. Ward's Late Free—First rate. My three years old trees bore too full, but specimens on my two years old were large and fine. Its time of ripening seems much earlier with me than it should be. (See the Fruit Books of Thomas, Elliott, and Hooper.)

10. Heath Freestone—Fruit large, and therefore sells well.

11. Fox's Seedling—A good peach, moderate bearer, profitable.

12. La Grange—Very fine for a late peach, and bears well.

13. Heath Cling—A fine bearer and a magnificent peach. Makes a beautiful white preserve, and, when put up in cans, is sweet enough without sugar.

14. Smock Freestone—Bears well and sells well, but its flavor is only so-so.

15. Delaware White—A large, white freestone. Valuable for its lateness.

To the above, add

16. Hale's Early—Ripening some days before Early Tillotson.

17. Oldmixon Freestone—Ripening after Bellegarde, and the list for a profitable peach orchard is as complete as I can make it with my present information.

CHARLES B. PELTON.

MAKANDA, ILL., *December*, 1862.

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STATEMENT OF J. FRANCIS & SONS.

APPLES.

The apples we exhibit for the best three varieties of winter apples are the Hubbardston Nonsuch, Winesap and Swaar—named in the order of ripening. The Hubbardston Nonsuch, as a tree, is hardy, a moderate grower, and regular bearer, while the fruit is remarkable for its regular shape and beautiful color. We have fruited it a number of years, and find that it is perfectly at home on our prairie soil; keeps through January, and is a mild, good flavored apple.

The Winesap, as a tree, grows well, is hardy, bears young and profusely; it is also a very regular shaped, beautiful high colored apple, keeping well into February and March, and of excellent quality.

The Swaar we also find to be a hardy, thrifty, wide spreading tree, a *good* bearer, good keeper—keeping into March and April, and may be kept through May—while the quality is A No. 1.

J. FRANCIS & SONS,
Springfield, Illinois.

STATEMENT OF J. FRANCIS & SONS.

MANUFACTURE OF CIDER.

The cider which we have entered for a premium was made in November, from a mixed lot of apples, on a portable mill; barrel filled up, and pumice worked off at the bung. After working between one and two weeks, ten ounces of sulphate of lime, mixed with a quart of cider, was put into the barrel, and the whole thoroughly shaken, then bunged up tight and put into the cellar.

J. FRANCIS & SONS,
Springfield, Illinois.

STATEMENT OF H. NOBLE.

MANUFACTURE OF WINE FROM NATIVE GRAPES.

Mr. J. P. Reynolds:

I herewith present you a sample of wine made from the native grape.

The wine is made by extracting the juice of the grape by compression. To each gallon of juice one gallon of water is added, and three pounds of sugar are added to each gallon of the mixture.

It takes about twelve bushels of grapes to yield a barrel of forty gallons of wine.

The wine improves by age, for three years, which is as long as I have kept any yet.

The specimen presented was made in the fall of 1861.

Respectfully, &c.,

H. NOBLE.

January 20, 1863.

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TRIAL OF AGRICULTURAL IMPLEMENTS,

HELD AT DECATUR, COMMENCING SEPTEMBER 21, 1863.

REPORT OF THE COMMITTEE.

To the Executive Board of the Illinois State Agricultural Society:

GENTLEMEN OF THE BOARD: Having been appointed by you as a committee to attend the trial of implements, and to award premiums thereon, to be held at Decatur, Macon county, Illinois, commencing on the 21st of September, 1863, we beg leave to report as follows:

The weather was very fine throughout the week of the trial, though the summer drouth had left the soil in a hard and unyielding form for the trial of earth displacing implements. The number of implements entered was not large; but, what was of most interest, nearly all of them came into the field of trial for the first time, and were new candidates for public favor.

Doubtless the entry fee had something to do in limiting the number, as none felt disposed to enter the lists without they were sanguine of success; however, the competition was spirited, and the interest deepened as the trial progressed.

It is interesting to watch the improvements in agricultural implements from year to year; but still more so to review the progress of invention during the last ten years, and compare those of 1863, with those presented at the first Illinois State Fair, held at Springfield in 1853, just ten years ago.

The steel plow and reaper had just been given to the world, but we had no double-shovel plows, no two-horse cultivators, and no successful gang plows. With the exception of the form of the steel clipper plow, which has undergone little change, the whole family of farm implements have been vastly improved, and a large number of new ones added.

The committee lay no claims to infallibility, in making their awards; but they do claim to have made their decisions according to their best judgment. They, also, claim that those receiving no premiums have gained by the exhibition. They have brought their implements into general notice, and many witnessing the trial

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may differ with the committee and advocate and purchase those not having on the blue ribbon.

Another view of this question. The inventors, the manufacturers, the curious, and all interested, have met face to face. There has been unconsciously a strong friction of mind against mind. Genius has chafed against genius. Ingenuity has rubbed hard against ingenuity. The fruits of this will be seen hereafter. Many a man who came to the place of trial, thinking and believing he had all the ideas of value on any given point, will go home with quite a "large flea in his ear."

In order to observe as much system as possible in our report, we will commence with, probably, the first agricultural implement ever invented.

The plow, unlike many modern inventions on the ground, dates back into the "misty past," to "time immemorial." Our first parents, after being driven from the garden, where cast steel plows and double-shovel cultivators were not needed, were obliged to improvise some kind of a plow, or earth-displacing machine, to stir up the new made earth, in order to obtain their bread by the toil of their hands and the sweat of their brows; and from that day to this—say in the neighborhood of 6000 years—mankind have been altering, improving and obtaining new patents on the plow; and it seems quite plain, by the feeling manifested at this trial, that they are not through with it yet. To illustrate: Let us refer back to the days of Cincinnatus, who is represented to have been quite a respectable farmer, and who, to save the city of Rome, had to leave the plow in the furrow and head her victorious armies.

Now let us imagine that the same Gen. Cincinnatus could have been placed down at the beautiful farm of Dr. Johns, at Decatur, Illinois, in the year 1863, and have the gang-plows, the trench-plows, the sub-soilers, the double-shins, the rolling coulters, etc., etc., would not Gen. Cincinnatus have been slightly surprised? And supposing Gen. C. had critically compared the Dement plow, manufactured at Dixon, and the Deere plow, manufactured at Moline, and the Dickinson and Orahood plow, manufactured at Clinton, and the Runk gang-plow, manufactured in Egypt, (we mean Egypt, Ill.) In short had the Gen. compared all the plows on the ground with the Cincinnatus plow, manufactured at Rome, Italy, would he not have surrendered (the plow in question, not the army,) without a contest? We, as your committee, "reckon" he would.

—

TWO-HORSE PLOWS, FOR GENERAL PURPOSES.

1. John Dement, Dixon.
2. Chas. H. Deere, Moline.
3. Dickinson & Orahood, Clinton.

GOLD MEDAL awarded to Col. JOHN DEMENT.

No. 1 was a double-shin, cast steel plow, fourteen inches cut, and

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was run seven inches deep, with draft of three hundred and fifty pounds. The owner operated this plow himself, and did most excellent work in all positions in which it was placed. The shop price of this plow, at retail, is sixteen dollars, to which four dollars is added for the rolling coulter, an implement that no good farmer can dispense with.

No. 2 was operated by a hand hired for the occasion. The committee cannot be responsible for the handling of implements on trial, it is their business to take things as presented to them, not as they might be supposed to be, if presented in a different form. This plow is of cast steel, with a cast steel share, cast in iron moulds. It was made with a double shin, its width of cut was twelve and a half inches, though it turned a wider furrow, and at the depth of seven inches the draft was four hundred pounds. It turned a most beautiful furrow, and had the appearance of running light, but to the surprise of the committee, its draft appeared heavy. To verify this several trials of the draft were made, but without finding any change in the result. The shop retail price of this plow is seventeen dollars, and four for rolling coulter. It was no easy matter to decide between these two plows, but the extra cost and draft was considered an over-match for a little smoother surface, and the award went as above stated.

No. 3 has the appearance of a good plow, but came to the trial unprepared. It had no rolling coulter, and was not polished for turning a clean furrow, until the second day. It cuts twelve inches wide, and at six inches deep the draft was two hundred and fifty pounds. Price for cast steel, sixteen dollars. After the commencement of the trial the owners saw that without the coulter, which had disappeared somewhere on the railroad, it would be useless to make a serious attempt, and contented themselves with an exhibition. The plow is well worthy the farmers of De Witt county, and will doubtless be prepared to make a better record another year.

The last mentioned firm also presented a turf plow, which worked well, and was pronounced by all who saw it, a good plow; but as there was no competition, the committee, under the rules, have no authority to award a premium.

In selecting the ground, the committee designedly procured one piece that was hard, rough and weedy, which made it quite hard for teams and plowmen; but the plows were operated with much credit, and all did good work.

GANG PLOWS.

1. Jacob L. Runk, of Nashville, the county seat of Washington county.
2. William L. Black, of Lancaster, Cass county.
3. J. G. Robinson, Springfield.
4. J. & G. Siebert, Ashley, Washington county.
5. By the same, with three plows.

GOLD MEDAL awarded to JACOB L. RUNK.

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Frye's gang Breaking Plow has been at the State Fair on several occasions, but its usefulness has never been established, and it has gone out of sight.

Gang plows for old land and for subsoiling, have now, for the first time, come before the Society for a trial, though they are not entirely a novelty on the Fair grounds. The interest in the gang plow has been steadily gaining ground, for the past two years, more especially since the war has drawn so largely on farm hands. Their sale has been largely augmented, and they have generally given satisfaction. For these reasons the trial of these new implements was an exciting one to the large crowd of spectators, who entered warmly into the contest.

It is difficult to decide how far to recommend a comparatively new implement, on so short a trial, as that of the gang plow in its present form. Mechanics and practical farmers have for a long time been in favor of mounting the plow on wheels, but thus far their expectations have not been fully realized. There are several questions yet to be answered in regard to it before the gang plow, or even the single plow, will be properly mounted so as to come into general use. The committee confess to no small pleasure in this trial of gang plows, and trust that they will prove a complete success. At the same time they are not prepared to say how many plows in a gang are best, or how much power should be applied. It is found that three horses abreast economise power to the best advantage, and it is probable that one or two plows cutting one or two furrows within the capacity of such a team may be found the most economical, say a draft of five hundred pounds.

The plows on trial were drawn by four horses to each, and operated as follows:

No. 1. Two plows of 10 inches each, running 5 inches deep, with a draft of 550 pounds. Cost $55; without the steel springs for seat, a deduction of ten dollars is made, or $45.

Three horses can manage this plow at that depth very easily. The plows are easily adjusted, and the whole is well made.

No. 2. Two plows. Cut 12¾ inches each, or 25½ inches in all. Depth, 5 inches. Draft, 575 pounds. Price, $45. Two teams required to work it.

This, in some respects, is the best implement, but is less adjustable and convenient to operate. The committee were somewhat at a loss to decide, and regretted that a second premium had not been offered, to enable them to award it to this plow.

No. 3. Two plows. Cut 12 inches wide each, and 5 inches deep. Rolling coulter, and two teams required to work it. Cost, $80. Draft, 675 pounds.

No. 4. Two plows. Cut, 12 inches wide and 5 inches deep. Cost, $70. Draft, 550 pounds. Two teams required.

This was a highly finished and beautiful piece of workmanship, and attracted more attention than any of the others, for this reason.

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The high price was the most serious charge against it, and the most potent in placing it in the list after Nos. 1 and 2. The draft of No. 3, and its lack of adjustability, setting it aside, though this was probably the strongest plow on the ground, and would stand more hard usage.

No. 5, by J. & G. Seibert, as above, with three plows, cutting in all 36 inches wide and 5 inches deep. Price, $85. Draft, 800 pounds. Two or three teams required. The committee think there should be three teams in all cases where it is used to any extent.

By attaching two teams one man can drive his two plows and ride on a spring seat equal in comfort to any buggy seat, with an umbrella over his head if he likes, and at night have just as much plowed as two men would have had by separating the teams, using the ordinary plow and walking all day among the clods; while the one on the gang plow would have a fine buggy ride, and not feel as tired and weary at night as the others. Now the question is, can it be done equally well, with no more labor for the teams? Your committee think it can be, and will be, or that at least the old plow jogger will be mounted on his buggy seat, with two, and probably three horses, with one wide, or may be, two narrow plows—if the rotary spader does not throw the steel clipper out of place.

While speaking of riding on gang plows, let us look at the general principle of riding on all, or nearly all, of the agricultural implements now in use—for inventors and makers are fast tending that way. Here it is, see how it looks:

A Spring-seat Plow.
A Spring-seat Harrow.
A Spring-seat Roller.
A Spring-seat Cultivator.
A Spring-seat Corn Cutter.
A Spring-seat Sower and Driller.
A Spring-seat Mower.
A Spring-seat Rake.
A Spring seat Reaper.

Now you will see that about all a farmer would have to get out of his buggy for on this plan, would be to shut the gate and take care of his team, and then be ready to read the dispatches in his last daily paper.

Another important idea in this connection, is,

FEMALE HELP.

When farmers' sons are away fighting to save their country—many of them already dead or maimed for life in the present unhappy struggle—then it is that the daughters, and sometimes the wife, are ready and anxious to lend a helping hand, if they can do it consistent with their strength and womanly feelings, and not compromise their dignity and sense of propriety by so doing. And who ever knew a female that did not like to drive a good span of horses when she felt safe in doing so?

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However lightly some may consider this subject, we consider it a serious and important one. How much better it would be, in your committee's estimation, for many good and intelligent girls who are running altogether to the romantic and ornamental, to mix in occasionally a little of the useful. For instance, let them try for one day, and close up the piano, shut the music book, lay aside "Annie Laurie," "Jamie's on the Stormy Sea," "When this Cruel War is Over," "They have Grafted him into the Army," and all the sheet music that is laying around loose, and what then? Well, your committee would respectfully suggest that they put on their high heeled, thick soled shoes, shaker bonnet, "the other dress," and, if they would just as soon, leave their hoops in the dark bed room, and then, with a proud step and patriotic heart, mount on to a good, clean, painted and varnished two-horse cultivator, reaper or mower, and have the satisfaction at night of having had a fine day's ride, and saving their dear fathers two dollars per day. Let us not be misunderstood on this subject. We do not wish to discourage the ornamental among the farmers' daughters nor any of the fair daughters of Illinois, but only to recommend a little stronger mixture of the useful with the ornamental.

We will now try to get back to the legitimate line of our report, in which, next in order, is the

TRENCH PLOWS.

1. W. L. Black, of Lancaster, Cass county.
2. J. G. Robinson, of Springfield, Illinois.

SILVER MEDAL awarded to W. L. Black.

The plows are designed to be so set on the beam that one will work directly behind the other, but deeper in the ground. The design is, deep plowing, draining and recuperating worn out lands.

In this case one of the plows was taken from the gang plow, and the trench plow placed as above stated. It is simply the gang plow with a trench plow attachment, by continuing the beam some sixteen inches in the rear. By this process the plows run very steady, and do superior work. This trench plow could be replaced with a sub-soil plow in the same manner.

No. 1. Cut twelve inches wide, and ten inches deep, with a draft of 675 pounds. The cost is $45.

No. 2. Cut the same width and depth, with draft of 725 pounds. Cost, $80.

If many of the farms of Illinois could have such a stirring up the owners would see some of their own soil they never saw before, and there would be less complaint of the effects of drouth and poor crops.

Trench and sub-soil plowing are becoming more and more popular, as they are found to pay well in the end. In the planting of orchards, of vineyards, of small fruits, and for gardens, the land should be trench-plowed at least twelve inches, and a Mapes' lifting

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sub-soil plow to go four inches below this. Nothing short of this will give us the best results in those departments of rural pursuits.

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CULTIVATORS.

1. Barber & Hawley, (Stafford's patent,) Decatur.
2. Pratt & Parker, (Morton Cultivator,) Morton, Tazewell county.
3. Furst & Bradley, Chicago.
4. A. J. Parks, Wyanet.
5. W. D. Dorsey, Decatur.
6. Charles H. Deere, Moline.
7. Gilbert & Hamilton, (Brown's patent,) Kewanee.

GOLD MEDAL awarded to BARBER & HAWLEY, for Stafford's patent.

The sulky, or two-horse cultivators, seemed to attract great attention, and a lively interest was felt by the friends of each in the results of the trial. There were seven excellent machines entered, either of which, a few years ago, would have been called perfection itself. Here was the great difficulty of the committee. To decide between seven machines, all having their general and separate merits, was truly a task. We tested them in hard ground, in soft ground, in all sorts of ground, and found them well adapted to the work for which they were designed. One feature of the Stafford machine finally turned the scale in its favor. Its adaptability to yield to and to run over obstacles, such as boulders, stumps, roots, dead furrows, and the like, without liability to break, is quite a point gained. It also had some minor advantages, nearly, or all of which can be made available in the other machines; but the one first named is of too great importance to be easily passed over. The Morton Cultivator stood deservedly high with the committee, but as all had high merits we cannot be invidious.

The cost of some of these machines will recommend them to those who have less to do, or have land clear of stumps, stones, or other obstructions. No. 1 cost $50, delivered at nearest depot to the purchaser; Nos. 2, 3, 5 and 6, cost at the shop, $35 each; Nos. 4 and 7, $40.

For the benefit of those who have had little experience with the use of these new and most valuable implements, we give some idea of what Stafford's will do, premising that all the others are more or less valuable for the same purposes, in some respects superior, though in others defective, yet most if not all of them are capable of doing the same work, but for rough and uneven ground it must continue the most valuable, as it is neither liable to get out of order, much less to have the shovel standards broken, which has been found a great drawback in most other Cultivators, not only entailing expense, but what is of more importance, causing delay. Corn can be worked so soon as you can see the rows, without danger of covering it with clods or earth. The shovels will throw the earth to or from the plants as desired. In the culture of potatoes, it will hill them up gradually and keep down the weeds at the same time. In the planting of potatoes, it is valuable, as with

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it the trenches for the seed can be made and the seed covered; and we suggest that it may be found useful in digging the crop. In the forming of sweet potato ridges it is probably the only implement that will do the work, by thoroughly pulverizing the soil and making a good mellow ridge, though this must be finished by hand with the steel rake, by hauling the loose earth between the ridges to the top. Thus this implement, will not only save a large part of the work in the planting of the sweet potato, but will do it better, and all this time the driver rides, and there is no more trouble to drive than when the team follows the furrow. We are satisfied that this implement will at once quadruple the area of this crop. This Cultivator was also shown as a

PLOW CULTIVATOR.

By the addition of two more shovels, it was set to work preparing land for seeding and cultivating in the seed. In this respect it is far more valuable than the harrow.

Land that has been fall plowed for the spring crops will be greatly benefited by the use of this implement, seven to eight acres of which can be stirred to the depth of four or five inches in a day.

We might make further enumerations of the value of these Cultivators, but must content ourselves by saying, that they will not only cheapen the cost of the culture of the rowed crops, but will greatly increase their yield. In the sowed, and all other crops, they will almost entirely supercede the use of the harrow, doing the same work better, and in most cases, with less labor.

They cost considerable, but they dispense with the harrow, which costs	$12
Two double shovel plows	11
One man for 60 days, driving one horse with double shovel plow in cultivating corn, etc	60
	$83
Allowing for its wear and interest one year	13
We have a saving of	$70

With these facts before him, we ask if there is a farmer owning two horses who can afford to do without a sulky two-horse cultivator, be it any one of the seven above named.

—

CORN PLANTERS.

No. 1. Selby & Elder, Peoria. Cost, $35.
No. 2. J. Armstrong, Elmira, Stark county. Cost, with steel runners, $40.
No. 3. J. C. Moore, Peoria. Cost, with steel runners, $45.
No. 4. Hayworth & Co., Springfield, rolling cutter attached. Cost, $38.
No. 5. McGaffey & Co., Chicago, called the "Automaton Planter." Cost, $35 to $45.

SILVER MEDAL, awarded to SELBY & ELDER.

The two-horse corn planters, dropping and covering two rows at a time, have done much to cheapen the growing of corn by substituting animal for hand labor. They are still very popular. By

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the way, genius is whispering in our ears that the form of the planter must soon be dispensed with, the planters attached to an iron field roller, with which the planting and rolling are to be done at one operation, with two horses and one man to drive. We repeat this to the corn planter makers and give them due notice to govern themselves accordingly.

The above award was not made with any regard to the supposition made above, but to correspond with the present mode of checkrow planting.

The committee were much pleased with the rolling cutter in No. 4, and think it a desirable improvement. No. 5 is a very ingenious machine, and should rank high; it has the elements of success, and must yet make its mark among corn planters.

Here the committee found the same difficulty as in the case of the cultivators. All were good machines, and but one premium to award. If the public differ with them, and prefer any other machine, they are hereby assured that they will have a machine that will please them. The question was a difficult one to decide, and the committee are free to confess that price and good workmanship had something to do with the award, for all did good dropping. The corn planter of G. W. Brown failed to arrive in time for the trial, but was on exhibition at the Fair. We note one improvement in this old and popular machine, and that is a contrivance for making the rows of any width, from two to four feet. This will adapt it to the planting of beans or the smaller kinds of corn that need less width of row.

—

ONE-HORSE CORN PLANTER.

Maples & Co., of Chicago, exhibited a very simple and ingenious one-horse planter and cultivator, but as there was no competition, we cannot award a premium. We cheerfully recommend it to those who follow farming on a small scale, and do not wish to purchase a high priced machine. The cost is only $14. We would call the attention of market gardeners to the value of this implement. It will be found useful in cultivating narrow rows of vegetables. It is a combined planter and cultivator, planting in hills at such distance as the operator may desire.

—

FIELD ROLLER.

Mr. C. D. Roberts, of Jacksonville, exhibited a sectional field roller. The two sections are connected in the centre by a hinge, which adapts it to an uneven surface. Price $20. No competition.

We think the iron roller must soon take the place of the wooden ones, whether made in large drums or cut from the solid log. The iron roller should be cast in sections of about one foot each and run

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on an iron axle; it should not be over twenty-two inches in diameter, for the large drum rollers do not mash or grind the clods, but merely press them into the soft soil. The power should be applied to the centre of motion, and not from the top of the implement, as is now done by our Eastern friends. The iron suface is hard and grinds the clods to powder, while the soft earth adheres to the wood, presenting to the clods a soft, yielding surface that has little effect on them. A wood roller is better than none, but is vastly inferior to one of iron.

—

COULTER HARROW.

G. P. Lawrence, of Pana, Christian county, Illinois, exhibited B. W. Spears' Patent Coulter Harrow. Instead of teeth, as usual in most harrows, it has plates of steel with a twist similar to the mole board of a plow. It seemed to work well, but requires more actual service to determine its merits.

—

SEED DRILL AND ROLLER.

W. B. Quarton, of Carlinville, Macoupin county, Illinois, presented a seed drill and roller. The roller is corrugated, pressing the seed down into a cavity and leaving a ridge between the drills. The plan is not altogether new, and as the machine is heavy, and consequently too much for one team, with a cost of $90, it is not probable that it will soon come into public favor.

—

BROAD CAST SOWER AND CULTIVATOR.

One was exhibited by Allen & Warren, of Chicago, Illinois. Price, $75. Works six feet in width. It scatters the seed very even, and the amount per acre is easily varied as parties desire.

The cultivators, which are small, are numerous, and so close to each other that they gather weeds and stubble, and thus clog them. In perfectly clean and well pulverized soil, such as a sandy loam, it is doubtless valuable, but the impression of its value for our prairie farms, made at this trial, was not a favorable one, as it was made on a piece of weedy stubble land.

—

GRAIN DRILL.

J. S. Gage, of Dowagiac, Michigan, presented a grain drill; cost $90; 5 feet 8 inches wide.

This is a well made grain drill, though for some reason the operator failed to cover the seed as it should have been done, probably on account of the old stubble.

These grain drills will none of them do good work only on clean,

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well pulverized dry soils. No ingenuity has been able thus far to adapt them to other soils, hence they have not come into general use and to-day are less popular than fifteen years ago. For the sowing of spring grains they are of no value.

—

NAZARINE COMBINED CORN PLOW AND DRILL.

J. Parsons presented the above machine for trial. Price, with six shovels, $50; with four shovels, $45. Notwithstanding Mr. Parsons was a little hard of hearing, he has quite a machine. It can be used for cultivating corn, and, by a regular transformation, he converts into a seed drill. He has been at work on it for some fifteen years. Perhaps ten years longer will make it a desirable machine. We wish the old gentleman much success with his machine.

—

ROTARY SPADER.

Mr. Comstock, of Milwaukee, Wisconsin, put his spader in operation in presence of the committee. In consequence of delay by railroad, he did not formally enter it for a premium. Many have supposed, and do yet, that a spading machine can be invented to supersede the plow. It will probably be some time first. This Comstock spader requires two teams, and works the ground three feet wide and eight inches deep. It loosens and pulverizes the soil very finely. But whether it can be made a practical machine for farmers must be left to actual and continued trial. Price $200.

The notion that the soil should be inverted, is fast giving way, thus opening the field for this class of implements. That the surface and under soil of our prairies are benefited by mixing, has been long since conceded, and when thoroughly mixed, as is done by the spader, there are less seeds of weeds exposed to the surface than one would suppose. This spader covers the idea of trench plowing.

The committee regret that they could not have given this new machine a thorough trial. Should it succeed, it will take the place of the common plow to a large extent, especially on large farms. Its cost, and amount of team required, will tend to drive it from the small farm, unless found much more valuable than the steel clipper. We cheerfully commend it for trial.

—

CORN AND CANE CUTTER.

W. M. Mason, of Polo, Ogle Co., Ills., exhibited a one-horse corn and cane cutter. All that saw it work were satisfied it must, in time, come into general use, and be of great value to the farming community, especially where they make a business of cutting

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and shocking their corn. It is very much on the reaper principle, only smaller, and cuts one row at a time. It needs some little improvement in construction and price. Price $110.

For the cutting of Sorghum it will be of great value. One horse and boy can cut three to four acres a day, probably an average of three acres. The gavels of cut corn can be laid in line at the will of the driver, so as to be convenient to shock up or load on a wagon. In this connection, Mr. Mason has a *form*, weighing but a few pounds and costing a dime or two, that is exceedingly useful in shocking; it is not patented. We cannot too highly commend this corn and cane cutter to the attention of all interested.

—

SOD SEEDER AND BROAD CAST SOWER.

Hon. J. B. Duane, of Schenectady, N. Y., exhibited this machine on Saturday, late in the afternoon. He, too, had been disappointed by railroad delays. This combined implement comes to us highly recommended by the Secretary of the State Agricultural Society of the State of New York. There being no competition, the committee had no authority to award a premium. It combines more principles, as a machine, than any other one on exhibition. Instead of wheels, it moves on a roller, in the center, 30 inches in diameter, which is a part of the machine itself. It is drawn by one span of horses with ease. First in order comes the cultivator teeth; second, the grain rolls down over an inclined plane in sight of the driver, and is well scattered by wire pins; third, a drag with teeth inclined backward, so as to pass over weeds and stubble without clogging; fifth, a grass seed sower, the amount per acre regulated by a thumb screw; sixth, a saw tooth drag, to cover grass seed; seventh, the roller, which leaves the ground quite smooth behind it; eighth and last, a cylinder, for sowing plaster or guano, also regulated as to quantity per acre. As a whole it should be thoroughly examined by the farmers of Illinois, for, if it will work well on our prairies, it will certainly be a great labor saving machine.

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PRICES OF IMPLEMENTS.

In conclusion, we will add a few words on prices of implements. We believe, as a general thing, the prices are too high from the

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OFFICIAL LIST OF AWARDS

AT THE ILLINOIS STATE FAIR OF 1863.

CLASS A—CATTLE.

R. H. Whiting, Galesburg, *Superintendent.*
C. J. Reynolds, Dixon, *Acting Superintendent.*

LOT 1—SHORT HORN BULLS.

BULLS OVER FOUR YEARS OLD.

First Premium to Farmer, owned by Isaac Camp, Monticello, Illinois.....$20
Second Premium to Goldfinder II, owned by J. C. Bone, Pleasant Plains, Illinois.... 10

BULLS OVER THREE AND UNDER FOUR YEARS OLD.

First Premium to Hickory, owned by J. C. Bone, Pleasant Plains, Illinois..... 20
Second Premium to Booth, owned by Jesse Stevens, Wilmington, Clinton Co., O ... 20

BULLS OVER TWO AND UNDER THREE YEARS OLD.

First Premium to Grand Duke of Airdrie, owned by J. M. Hill, Lancaster, Illinois.... 20
Second Premium to White Comet, owned by A. Eyman, Harristown, Illinois..... 10

BULLS OVER ONE AND UNDER TWO YEARS OLD.

First Premium to Sangamo Duke, owned by James N. Brown, Berlin, Illinois..... 20
Second Premium to Ira Moore, owned by J. G. Taylor, Decatur, Illinois..... 10

BULL CALVES.

First Premium to Gen. Halleck, owned by J. M. Hill, Lancaster, Illinois..... 20
Second Premium to Gen. Reno, owned by J. M. Hill, Lancaster, Illinois..... 10

Awarding Committee.—John H. White, Rockford, Illinois, Chairman; Peter Sweat, Peoria, Illinois; James M. Thomas, Wyoming, Stark county, Illinois; Asa Weedman, Santa Anna, DeWitt county, Illinois; Wm. Y. McCord, Santa Anna, DeWitt county, Illinois.

SHORT HORN COWS AND HEIFERS.

COWS OVER FOUR YEARS OLD.

First Premium to Emerald, owned by J. C. Bone, Pleasant Plains, Illinois.....$20
Second Premium to Lady Admiral, owned by J. M. Hill, Lancaster, Illinois..... 10

COWS OVER THREE AND UNDER FOUR YEARS OLD.

First Premium to Blanch, owned by J. H. Spears, Petersburg, Illinois..... 20
Second Premium to Ruby II, owned by J. M. Hill, Lancaster, Illinois..... 10

HEIFERS OVER TWO AND UNDER THREE YEARS OLD.

First Premium to Lady Smith, owned by J. M. Hill, Lancaster, Illinois..... 20
Second Premium to Vanity, owned by Jas. N. Brown, Berlin, Illinois..... 10

HEIFERS OVER ONE YEAR AND UNDER TWO YEARS OLD.

First Premium to Countess, owned by James N. Brown, Berlin, Illinois..... 20
Second Premium to Goodness, owned by J. M. Hill, Lancaster, Illinois..... 10

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HEIFER CALVES UNDER ONE YEAR OLD.

First Premium to Victoria IV, owned by J. N. Brown, Berlin, Illinois.....$20
Second Premium to May Dacre, owned by J. N. Brown, Berlin, Illinois..... 10

Awarding Committee.—B. G. Roots, Chairman, Tamaroa, Illinois; John Wentworth, Chicago, Illinois; Samuel Stookey, Belleville, Illinois; O. M. Conkey, Homer, Illinois; E. B. Hitt, Exeter, Illinois.

LOT 2—DEVONS.

BULLS OVER FOUR YEARS OLD.

First Premium to Archer, owned by P. S. Spencer, Danville, Illinois,.....$20

BULLS OVER TWO AND UNDER THREE YEARS OLD.

Second Premium to Colonel, owned by H. C. Johns, Decatur, Illinois..... 10

HEIFERS OVER TWO AND UNDER THREE YEARS OLD.

Second Premium to Nora, owned by H. C. Johns, Decatur, Illinois..... 10

Awarding Committee.—E. Seely, Chairman, Portland, Illinois; Wm. B. Foreman, Nashville, Illinois; John Davis, Decatur, Illinois; E. R. Shankland, Dubuque, Iowa; John Wentworth, Chicago, Illinois.

LOT 6—MILCH COWS.

First Premium to Bet, owned by S. J. Morey, Clayton, Adams county, Illinois.....$50

Awarding Committee.—E. Seely, Chairman, Portland; J. B. Ricks, Taylorville; James Wilson, Springfield; James Wilson, Sandoval; Carlton Bailey, Lee county.

LOT 7—GRADES AND CROSSES.

COWS THREE YEARS OLD AND OVER.

First Premium to Cherry, owned by S. J. Morey, Clayton, Illinois.....$15
Second Premium to Camilla, owned by J. H. Pickrell, Harristown, Illinois..... 10

HEIFERS TWO AND UNDER THREE YEARS OLD.

First Premium to Laura, owned by J. H. Pickrell, Harristown, Illinois.....15

HEIFER CALVES.

First Premium to Red, owned by J. Cloyd, Champaign, Illinois..... 10
Second Premium to Dora, owned by J. H. Pickrell, Decatur, Illinois..... 5

LOT 8—FAT CATTLE.

BULLOCKS OVER FOUR YEARS OLD.

Premium to Darby, owned by Wm. Harpole, Williamsville, Illinois.....$10

BULLOCKS OVER TWO AND UNDER THREE YEARS OLD.

Premium to Allen, owned by J. H. Pickrell, Harristown, Illinois..... 10

LOT 9—WORK CATTLE.

SINGLE YOKE FOUR YEARS OLD OR OVER.

First Premium to Pete and Paddy, owned by Urial Mills, Salem, Illinois... .....$10

Boy not over 16 years old for best trained yoke of steers over one and under two years old, to Willie and Watson Pickrell, Mechanicsburg, Illinois..... 10

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FIVE HEAD OF CALVES, MALE AND FEMALE, UNDER ONE YEAR OLD, AND FROM ONE COUNTY.

First Premium to James N. Brown, Berlin, Sangamon county.....$25
Second Premium to J. M. Hill, Lancaster, Cass county..... 15

COWS OR HEIFERS OF ANY AGE.

Premium to Lady Renick II, owned by J. M. Hill, Lancaster..... 40

BULLS OF ANY AGE.

Premium to Hickory, owned by J. C. Bone, Pleasant Plains..... 40

HERDS OF NOT LESS THAN FIVE ANIMALS DROPPED AND REARED IN THIS STATE, AND OWNED BY ANY ONE INDIVIDUAL.

First Premium to J. C. Bone, Pleasant Plains, Sangamon county..... 40
Second Premium to James N. Brown, Berlin, Sangamon county..... 20

Awarding Committee.—Charles Buford, Chairman, Rock Island; E. Seeley, Portland; E. R. Shankland, Dubuque, Iowa; John Davis, Decatur; W. B. Foreman, Nashville, and on the last ring W. O. Willson was substituted for John Davis.

CLASS B—HORSES, JACKS AND MULES.

GEN. J. W. SINGLETON, *Superintendent.*

LOT 11—THOROUGHBRED HORSES.

STALLIONS OVER FOUR YEARS OLD.

First Premium to Bill Alexander, owned by W. H. Renfro, Springfield.....$20
Second Premium to Hurricane, owned by Harness Trumbo, Springfield..... 15

MARES UNDER THREE AND OVER FOUR YEARS OLD.

First Premium to Sadena Barrington, owned by J. W. Bridges, Chatham..... 20

Awarding Committee.—Finis Evans, Makanda; J. B. Pirkins, Springfield; A. J. T. Prevoort, Quincy; G. W. Chatterton, Springfield; F. L. Rhoades, Shawneetown.

LOT 12—ROADSTER HORSES.

STALLIONS FOUR YEARS OLD OR OVER.

First Premium to Geo. M. Patchen, Jr., owned by Thomas Smith, Springfield.....$20
Second Premium to Forest Temple, owned by J. F. Love, Paris..... 15

STALLIONS THREE YEARS OLD AND UNDER FOUR.

First Premium to Dutch Pierce, owned by G. W. Stookey, Belleville..... 15
Second Premium to Young Monarch, owned by Alfred Culp, Decatur..... 10

STALLIONS OVER TWO AND UNDER THREE YEARS OLD.

First Premium to Rob Pruit, owned by G. C. Hall, Chicago..... 15
Second Premium to Ike Shepherd, owned by G. C. Hall, Chicago..... 10

MARES FOUR YEARS OLD OR OVER.

First Premium to Estelle, owned by G. C. Hall, Chicago..... 10
Second Premium to Miss Alice, owned by Thomas Smith, Springfield..... 15

MARES OVER THREE AND UNDER FOUR YEARS OLD.

First Premium to Jessie, owned by S. Hall, Decatur..... 15
Second Premium to Julia Singleton, owned by T. S. Adams, Mt. Sterling..... 10

FILLIES OVER TWO AND UNDER THREE YEARS OLD.

First Premium to Gray Eagle, owned by John Garris, Decatur..... 15
Second Premium to Lucy, owned by J. Spangler, Decatur..... 10

FILLIES OVER ONE AND UNDER TWO YEARS OLD.

First Premium to Puss, owned by Jeremiah Beatty, Jerseyville..... 15
Second Premium to Jenny Lind, owned by J. L. Shaw, Monticello..... 10

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MARE COLTS UNDER ONE YEAR OLD.

First Premium to Flora Hamilton, owned by H. S. Ross, Jerseyville.....$10
Second Premium to Betty, owned by Wm. Nicholson, Decatur..... 5

Awarding Committee.—Finis Evans, Makanda; A. J. T. Prevoort, Quincy; J. B. Pirkins, Springfield; G. W. Chatterton, Springfield; F. L. Rhoads, Shawneetown. In the rings, Mares and Fillies, John M. Knuckles was added.

LOT 12½—DRAUGHT HORSES.

[This lot was added to the regular list by the Executive Board on petition of the parties representing this class of stock, on Wednesday, September 30th.]

STALLIONS FOUR YEARS OLD AND OVER.

First Premium to Prince, owned by H. P. Finegan, Pekin.....$20
Second Premium to Sir George, owned by J. S. Davis, Sullivan..... 15

STALLIONS OVER THREE AND UNDER FOUR YEARS OLD.

First Premium to Great Eastern, owned by J. E. Dillow, Boynton..... 15

STALLIONS OVER TWO AND UNDER THREE YEARS OLD.

First Premium to Young London Tom, owned by Charles Mackay, Scales' Mound.... 15
Second Premium to Interest, owned by J. E. Dillow, Boynton..... 10

HORSE COLTS UNDER ONE YEAR OLD.

First Premium to Earnest, owned by J. E. Dillow, Boynton..... 10

MARES FOUR YEARS OLD AND OVER.

First Premium to Flora, owned by J. Gillin, Coulterville..... 20
Second Premium to Nell, owned by Herman Sox, Sterling..... 15

MARES OVER THREE YEARS OLD AND UNDER FOUR.

First Premium to Belle, owned by W. T. Baker, Mt. Auburn..... 15
Second Premium to Hattie, owned by J. E. Dillow, Boynton..... 10

MARES TWO YEARS OLD AND UNDER THREE.

First Premium to Kate, owned by D. H. Pennell, Shelbyville..... 15
Second Premium to Margaret, owned by Adolphus Dillow, Boynton..... 10

MARE COLTS UNDER ONE YEAR OLD.

First Premium to Dahlia, owned by J. E. Dillow, Boynton..... 10

MATCHED DRAUGHT HORSES.

First Premium to A. J. Barnes, Bloomington..... 20

[Awarding Committee not entered on the book.]

LOT 13—HORSES OF ALL WORK.

STALLIONS FOUR YEARS OLD AND OVER.

First Premium to Hamilton, owned by David E. Beatty, Jerseyville.....$20
Second Premium to Young Dio, owned by Henry Nave, Athens..... 15

STALLIONS OVER THREE AND UNDER FOUR YEARS OLD.

First Premium to Prince Albert, owned by B. E. Deo, Dixon..... 15
Second Premium to Monarch of the Prairies, owned by T. B. Warfied, Cerro Gordo.. 10

STALLIONS OVER TWO AND UNDER THREE YEARS OLD.

First Premium to Charley, owned by S. P. Earp, Livingston..... 15
Second Premium to Charley, owned by Samuel McKinley, Decatur..... 10

MARES FOUR YEARS OLD AND OVER.

First Premium to Kitty, owned by David E. Beatty, Jerseyville..... 20
Second Premium to Julia, owned by H. S. Ross, Jerseyville..... 10

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FILLIES OVER THREE AND UNDER FOUR YEARS OLD.

First Premium to Rebel Girl, owned by C. S. Brown, Berlin.....$15
Second Premium to Maria, owned by Harness Trumbo, Springfield..... 10

FILLIES OVER TWO YEARS OLD AND UNDER THREE.

First Premium to Lady Hamilton, owned by H. S. Ross, Jerseyville..... 15
Second Premium to Cynthiana, owned by G. Wolf, Bement..... 10

FILLIES OVER ONE YEAR OLD AND UNDER TWO.

First Premium to Fashion, owned by John S. Beatty, Jerseyville..... 15

SUCKING COLT, HORSE OR MARE.

First Premium to Coburn, owned by W. G. Shaw, Clinton..... 10
Second Premium to Mollie, owned by Wm. Kimmel, Jonesboro..... 5

Awarding Committee.—G. S. Adams, Brown county; A. McTrail, Brown county; E. C. Ingersoll, Peoria; F. L. Rhoads, Shawneetown; Isaac Cook, Chicago.

LOT 14—CARRIAGE, SINGLE HARNESS AND SADDLE HARNESS.

STALLIONS OVER THREE YEARS OLD, UNDER THE SADDLE.

First Premium to General Taylor, owned by Geo. A. Bean, Springfield..... $20
Second Premium to Mowhawk, owned by J. Pirkins, Springfield 10

MARES AND GELDINGS, FOUR YEARS OLD AND OVER, TO SINGLE HARNESS.

First Premium to Shylock, owned by A. E. Ingalls, Racine, Wisconsin..... 20
Second Premium to Frank Sponsler, owned by Alfred Culp, Decatur..... 10

MARES AND GELDINGS, OVER THREE YEARS AND UNDER FOUR, TO SINGLE HARNESS.

First Premium to Pontiac, owned by Bell Watkins, Springfield..... 20
Second Premium to Jessie, owned by V. A. Stookey, Belleville..... 10

MATCHED GELDINGS IN HARNESS.

First premium to J. C. Bone, Pleasant Plains..... 20
Second premium to A. J. Dresbach, Decatur..... 10

MARES AND GELLDINGS, THREE YEARS OLD OR OVER, UNDER THE SADDLE.

Premium to 'Bonnie Bell,' owned by D. S. Allen, Harristown..... 20

Awarding Committee.—Charles Ridgely, Springfield; Almon Thompson, St. Louis, Mo.; W. B. Forman, Nashville, Ill.; S. B. Sargent, Cedar county, Iowa; Peter Sweat, Peoria, Ill.; G. W. Chatterton, Springfield; A. J. T. Prevoort, Quincy.

LOT 15.—SWEEPSTAKES FOR HORSES.

LOT COLTS, NOT LESS THAN FIVE IN NUMBER, UNDER ONE YEAR OLD, SIRED BY ONE HORSE, AND SHOWN WITH THE SIRE.

Premium to Hamilton and five colts, owned by David E. Beatty and brothers, Jerseyville.....$25

STALLION AND FIVE BROOD MARES FROM ONE COUNTY.

First Premium to Prince John and five mares, owned by W. T. Baker and others, Rochester, Sangamon county..... 30

STALLIONS.

Premium to Hamilton, owned by David E. Beatty and brothers, Jerseyville..... 40

MARES.

Premium to Comet, owned by A. B. Knott, Monticello..... 40

[Awarding Committee not entered upon the Book.]

LOT 16.—JACKS, JENNETS AND MULES.

JACKS FOUR YEARS OLD OR OVER.

First Premium to Mazeppa, owned by G. M. Caldwell, Williamsville.....$20
Second Premium to Mammoth Warrior, owned by A. T. Thompson, Mechanicsburg... 10

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JACKS OVER THREE AND UNDER FOUR YEARS OLD.

First Premium to Josh Bell, owned by Walker & Co., Perryville, Ky.....$20

JACKS ONE YEAR OLD AND UNDER TWO.

First Premium to Tom, owned by J. W. & J. A. Brown, Jacksonville..... 15

JENNETS THREE YEARS OLD OR OVER.

First Premium to Mohawk, owned by D. S. Allen, Harristown..... 20
Second Premium to Laura, owned by T. J. Allenson, South Macon..... 10

PAIR MULES FOR DRAUGHT.

Premium to John H. McCord, Santa Anna 15

SINGLE MULE OVER THREE YEARS OLD.

Premium to John H. McCord, Santa Anna..... 10

SINGLE MULE OVER TWO AND UNDER THREE YEARS OLD.

Premium to C. M. Bridges, Chatham..... 10

SUCKING MULE COLT.

Premium to W. I. Tackett, Shelbyville..... 5

Awarding Committee.—J. A. Leaverton, Greenville, Chairman; A. W. McPhail, Brown county; Geo. Edmunds, jr., Hancock county; J. G. White, Macon county; Jesse Perkins, Sangamon county.

CLASS C.—SHEEP.

A. B. McConnell, Springfield, *Superintendent.*

LOT 17.—LONG WOOLED.

BUCKS OVER TWO YEARS OLD.

First Premium to Bill, (Cotswold,) owned by P. G. Bauder, New Milford.....$15
Second Premium to Dan, (Cotswold,) owned by J. J. Bauder, New Milford..... 10

BUCKS OVER ONE AND UNDER TWO YEARS OLD.

First Premium to Wm. Orr, Hamilton, Canada West..... 15
Second Premium to Frank, owned by P. G. Bauder, New Milford..... 10

BUCK LAMBS UNDER ONE YEAR OLD.

First Premium to D. S. Allen, Harristown..... 10
Second Premium to Wm. Orr, Hamilton, Canada West..... 5

PEN OF THREE EWES OVER TWO YEARS OLD.

First Premium to Wm. Orr, Hamilton, Canada West..... 15
Second Premium to J. J. Bauder, New Milford..... 10

PEN OF THREE EWES UNDER TWO YEARS OLD.

First Premium to P. G. Bauder, New Milford..... 15
Second Premium to Walker & Co., Perryville, Ky..... 10

PEN OF THREE EWE LAMBS.

First Premium to P. G. Bauder, New Milford..... 10
Second Premium to Wm. Orr, Hamilton, Canada West..... 5

[Awarding Committee same as for Lot 18.]

LOT 18.—MIDDLE-WOOLED, SOUTHDOWN, ETC.

BUCKS OVER TWO YEARS OLD.

First Premium to James N. Brown, Berlin.....$15
Second Premium to G. W. Becraft, Jacksonville..... 10

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BUCKS OVER ONE AND UNDER TWO YEARS OLD.

First Premium to James N. Brown, Berlin.....$15
Second Premium to G. W. Becraft, Jacksonville..... 10

BUCK LAMBS UNDER ONE YEAR OLD.

First Premium to Geo. W. Becraft,, Jacksonville..... 10
Second Premium to James N. Brown, Berlin..... 5

PEN OF THREE EWES OVER TWO YEARS OLD.

Firt Premium to Geo. W. Becraft, Jacksonville..... 15
Second Premium to P. S. Spencer, Danville..... 10

PEN OF THREE EWES OVER ONE AND UNDER TWO YEARS.

First Premium to James N. Brown, Berlin..... 15
Second Premium to J. H. Pickrell, Harristown..... 10

PEN OF THREE EWE LAMBS UNDER ONE YEAR OLD.

Firt Premium to James N. Brown, Berlin..... 10
Second Premium to G. W. Becraft, Jacksonville..... 5

Awarding Committee.—C. L. Pate, Catlin, Chairman; John Turnbull, Elmira; Andrew Oliver, Elmira.

LOT 19.—FRENCH MERINO SHEEP.

BUCK LAMBS UNDER ONE YEAR OLD.

First Premium to Charles H. Rosenstiel, Freeport..... ....$10

PEN OF THREE EWES OVER TWO YEARS OLD.

First Premium to Charles H. Rosenstiel, Freeport..... 15

PEN OF THREE EWE LAMBS UNDER ONE YEAR OLD.

First Premium to Charles H. Rosenstiel, Freeport..... 10

Awarding Committee.—John B. Hunter, Greenville; W. L. Beebe, Freeport; Wm. L. Wright, Salem.

LOT 20.—SPANISH MERINO SHEEP.

BUCKS OVER TWO YEARS OLD.

First Premium to Gold Blossom, owned by Ballinger & Mitchell, Nilwood.....$15
Second Premium to Enterprise, owned by Gorham & Gillett, Hadley..... 10

BUCKS UNDER TWO YEARS OLD.

First Premium to J. M. Gillett, Hadley..... . 15
Second Premium to Kirby & Davis, Lincoln..... 10

BUCKS AND LAMBS UNDER ONE YEAR OLD.

First Premium to Daniel Kelly, Wheaton..... 10
Second Premium to Daniel Kelly, Wheaton..... 5

PEN OF THREE EWES, OVER THREE YEARS OLD.

First Premium to Daniel Kelly, Wheaton..... 15
Second Premium to Daniel Kelly, Wheaton..... 10

PEN OF THREE EWES, UNDER TWO YEARS OLD.

First Premium to Daniel Kelly, Wheaton..... 15
Second Premium to Daniel Kelly, Wheaton..... 10

PEN OF THREE EWE LAMBS.

First Premium to Daniel Kelly, Wheaton..... 10
Second Premium to Daniel Kelly, Wheaton..... 5

Awarding Committee.—O. B. Nichols, Carlyle, Ill.; Horace Wells, White Oak, Ill.; W. P. Theyer, Chatham, Ill.

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LOT 21.—CROSSES OF PURE BREEDS.

BUCKS OVER TWO YEARS OLD.

First Premium to P. G. Bauder, New Milford $15
Second Premium to P. G. Bauder, New Milford 10

BUCKS UNDER TWO YEARS OLD.

First Premium to P. S. Spencer, Danville 12
Second Premium to P. G. Bauder, New Milford 8

BUCK LAMBS UNDER ONE YEAR.

First Premium to P. G. Bauder, New Milford 10
Second Premium to E. E. Gorham, Hadley 5

PEN OF THREE EWES OVER TWO YEARS OLD.

First Premium to P. G. Bauder' New Milford 15
Second Premium to E. E. Gorham, Hadley 10

PEN OF THREE EWES UNDER TWO YEARS OLD.

First Premium to P. G. Bauder, New Milford 12
Second Premium to P. S. Spencer, Danville 8

PEN OF THREE EWE LAMBS UNDER ONE YEAR.

First Premium to P. S. Spencer, Danville 10
Second Premium to P. G. Bauder, New Milford 5

(The above sheep were crosses of either French and Spanish or Spanish and Silesian.)

Awarding Committee.—Chas. H. Murtfeldt, Rockford, Chairman; E. D. Rose, Pittsfield, Ill.; John Turnbull, Elmira, Ill.

LOT 22.—FAT SHEEP.

THREE FAT SHEEP OVER TWO YEARS OLD.

Premium to Geo. W. Becraft, Jacksonville $10

LOT 23.—SWEEPSTAKES FOR FINE-WOOLED SHEEP.

ONE BUCK AND NINE EWES OF ANY AGE.

First Premium to Daniel Kelly, Wheaton, (Spanish Merino,) 20
Second Premium to Daniel Kelly, Wheaton, (Spanish Merino,) 10

LOT 24.—SWEEPSTAKES FOR MUTTON BREEDS.

ONE BUCK AND NINE EWES OF ANY AGE.

First Premium to D. S. Allen, Harristown, (Cotswold,) 20
Second Premium to J. H. Pickrell, Harristown, (Southdown,) 10

Awarding Committee.—James Millikin, Decatur, Ill.; Abner Riddle, Springfield, Ill.; J. T. Clark, Clinton, Ill.

CLASS D.—SWINE.

A. B. McConnell, Springfield, *Superintendent.*

LOT 25.—BERKSHIRES.

BOARS OVER ONE YEAR OLD.

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SOWS OVER ONE YEAR OLD.

First Premium to John Calhoun, Decatur.....$10
Second Premium to J. H. Crowder, Springfield 5

SOWS UNDER ONE YEAR OLD.

First Premium to John Calhoun, Decatur..... 10
Second Premium to J. H. Crowder, Springfield..... 5

SOWS WITH LITTER OF PIGS.

Firt Premium to T. J. Crowder, Springfield..... 15
Second Premium to Jesse Cloyd, Champaign..... 10

[Awarding Committee same as for Lot 26.]

LOT 26.—LARGE WHITE BREEDS.

BOARS OVER ONE YEAR OLD.

First Premium to O. Wallace, Clayton, (Magie,)..... 10
Second Premium to S. J. Morey, Clayton, (Chester White,)..... ... 5

BOARS UNDER ONE YEAR OLD.

First Premium to S. J. Morey, Clayton, (Chester White,)..... 10
Second Premium to F. Searls, Hadley, (Chester White,)..... 5

SOWS OVER ONE YEAR OLD.

First Premium to S. J. Morey, Clayton, (Chester,)..... 10
Second Premium to John A. Brown, Decatur, (Chester,)..... 5

SOWS UNDER ONE YEAR OLD.

First Premium to John A. Brown, Decatur, (Chester,)..... 10
Second Premium to O. Wallace, Clayton, (Magie,)..... 5

SOWS WITH LITTER OF PIGS.

First Premium to O. L. De Forrest, Janesville, Wisconsin..... 15
Second Premium to C. Snoad, Joliet, (Chester,).... 10

Awarding Committee.—O. Poole, Shawneetown, Ill.; C. Arms, Knoxville, Ill.. O. Barnard, Bloomington, Ill.; W. B. Webster, Paris, Ill.

LOT 27.—SMALL BBEEDS—SUFFOLK, CHINA, ESSEX, ETC.

BOARS OVER ONE YEAR OLD.

First Premium to J. M. Gillett, Hadley, (Suffolk,)..... 10

BOARS UNDER ONE YEAR OLD.

First Premium to J. A. Carpenter, Cobden, (Suffolk,)..... . 10

SOWS OVER ONE YEAR OLD.

First Premium to E. E. Gorham, Hadley, (Suffolk,)..... 10
Second Premium to J. A. Carpenter, Cobden, (Essex,)..... 5

LOT 28.—CROSSES.

BOARS OVER ONE YEAR OLD.

First Premium to C. Snoad, Joliet, (Suffolk and Leicester,)..... 10
Second Premium to W. S. Wallace, Springfield..... 5

BOARS UNDER ONE YEAR OLD.

First Premium to John A. Brown, Decatur, (Gipsey and Irish,)..... 10
Second Premium to Insane Hospital, Jacksonville, (Hospital breed,)..... 5

SOWS OVER ONE YEAR OLD.

Firt Premium to Chas. Conklin, Decatur, (Berkshire and Chester,)..... 10
Second Premium to Jesse Cloyd, Champaign..... 5

SOWS UNDER ONE YEAR OLD.

First Premium to John A. Brown, Decatur..... 10
Second Premium to Jesse Cloyd, Champaign..... 5

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SOWS WITH LITTER OF PIGS.

First Premium to John A. Brown, Decatur.....$15
Second Premium to Jesse Cloyd, Champaign..... 10

Awarding Committee.—C. Arms, Knoxville, Ill., Chairman; O. Barnard, Bloomington, Ill.; W. B. Webster, Paris, Ill.

LOT 29.—SWEEPSTAKES FOR SWINE.

BOAR AND THREE SOWS.

First Premium to J. H. Crowder, Springfield, for Imported Siddington, Victoria, 2d, Victoria, 3d, and Lady Edward, (Berkshire,).....$20
Second Premium to Insane Hospital, Jacksonville, for Monroe, Josephine, Mary and Louisa, (Hospital breed,)..... 10

BOAR OF ANY AGE.

Premium to M. F. Wickersham, Springfield..... 15

SOW OF ANY AGE.

Premium to James H. Crowder, Springfield, Victoria 2d..... 15

Awarding Committee.—Cyrus W. Vanderen, Springfield; J. G. Flesk, Dixon; Snowden Sargent, Oakland.

CLASS E.—POULTRY.

A. B. McConnell, Springfield, *Superintendent.*

LOT 30.—SHOW OF NOT LESS THAN FIVE DISTINCT BREEDS OF CHICKENS.

Premium to Mrs. Susannah Tate, Decatur..... $8

PAIR OF CHICKENS FOR FARMER'S USE.

Premium to J. A. Carpenter, Grey Dorkings, Cobden..... 3

SHOW OF PIGEONS.

Premium to John A. Brown, 6 pairs, Decatur..... 4

Awarding Committee.—J. T. Clarke, Clinton, DeWitt county; J. M. Thomas, Wyoming, Stark county; O. A. Alexander, Waynesville.

CLASS F.—MECHANIC ARTS.

Dr. Wm. Kile, Paris, *Superintendent.*

LOT 31.—PLOWS, CULTIVATORS, ETC.

[This lot comprises the implements which were tested by the committee in the field during the week preceding the Fair. C. W. Webster, Salem, Superintendent of Trial.]

Best two-horse Plow, for general purposes—John Dement, Dixon, Lee Co....Gold Medal.

Best Gang Plow—Jacob L. Runk, Nashville, Washington county.....Silver Medal.

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A large number of Implements in lot 31 came too late for trial, and were placed on exhibition at the Fair.

LOT 32.—THRESHING AND OTHER MACHINES, AND GARDEN TOOLS.

Best two-horse Power—A. Adams, Sandwich, DeKalb county.....Medal.

Best one-horse Power—L. P. Sanger & Co., Joliet.....Medal.

Best Fanning Mill—Roney Hansel & Co., Peoria and Pekin.. .....Medal.

Best Corn and Cob Mill—J. A. Carpenter, Beloit, Wisconsin.....Medal.

Best Cider Mill—A. H. Burlinghame, Sparta.....Medal.

Best Horse Power Corn Sheller—Lucien P. Sanger & Co., Joliet.....Medal.

Best Hand Corn Sheller—N. Drake, Newtown, New Jersey.....Medal.

Best Portable Hay Press—Sam'l Celahan, Cleveland, Ohio.....Medal.

Best Hay Pitching Machine—Wood, Fowler & Berry, Wyandotte Agricultural Works, Upper Sandusky, Ohio.....Medal.

Best Horse Hay Pitchfork—Palmer's Excelsior, T. G. & M. W. Palmer, Chicago..Medal.

Best Straw and Hay Cutter—Eureka Straw and Stalk Cutter, H. K. Parsons, Harrisburgh, Pennsylvania.....Medal.

Largest and best display of Agricultural Implements by the Manufacturer or his agent—Emerson & Co., Rockford.....Medal.

Best Spring Toothed Horse Rake—Furst & Bradley, Chicago.....Medal.

Awarding Committee.—W. C. Barnard, Chairman, Bloomington; John Parsons, Taylorville, Christian county; R. Greely, Decatur.

LOT 33.—ENGINES AND MACHINERY.

Best Garden Engine—R. C. House, Decatur.....Medal.

Best and Cheapest Wind Mill—R. W. Mills, Marcellus, New York.....Medal and $10

Best Pump for Well—R. C. House, Decatur.....Medal.

Best Pump for Cistern—P. J. Cooley, Chicago.....Medal.

Best Water Elevator, other than pump—Wadsworth's Patent Water Elevator, with tilting bucket, W. B. Wadsworth, Cleveland, Ohio.....Medal

Best Power Loom—Hand Power Loom, S. C. Mendenhall, Richmond, Indiana.....Medal.

Best Flour Packer—John Beall, Springfield..... .....Medal.

Best Mill for Grinding Sugar Cane—B. W. Skinner, Madison, Wisconsin, for model of Plantation Adjustable Mill.....Medal and $10

Best Sugar Evaporator, with apparatus necessary for making sirup and sugar—Railway Sugar Evaporator, Clark & Utter, Rockford.....Medal and $10

Awarding Committee.—A. Hammond, Chairman, Jacksonville; F. Priest, Decatur; E. Church, Edgar county.

LOT 34.—STOVES, CASTINGS, AND WORKED METALS.

Best Hose-Coupling—R. C. Howe, Decatur..... ..... Medal.

Best Kerosene Lamps—Lincoln Jones, Springfield.....Medal.

Best Portable Drop Lever Scales—Thomas Wilson, Metamora, Woodford county..Medal.

Best Machine for sharpening Knives and Scissors—Smith & Tanner, Chicago.....Medal.

Best Window Spring—W. W. Robinson, Rippon, Wisconsin..... .....Journal.

Best Gate Fastening—W. W. Robinson, Rippon, Wisconsin.....Journal.

Best Horse Shoes—H. H. Palmer, Rockford.....Journal.

Awarding Committee.—John Gage, Waukegan, Lake county; William Fielding, Chicago; G. S. Curtis, Chicago.

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LOT 35.—VEHICLES, FURNITURE AND HOUSEHOLD IMPLEMENTS.

Best display of Carriages of various kinds—E. M. Miller & Co., Quincy..... ..Medal.

Best two-horse Carriage—E. M. Miller & Co., Quincy.....Medal.

Best Top Buggy—Novelty Carriage Works, Chicago.....Medal.

Best Open Buggy—Novelty Carriage Works, Chicago.....Medal.

Best two-horse Wagon—John Kirkman, Peoria.....Medal.

Best twelve Brooms, Illinois manufacture—J. E. Price, Mt. Carroll.... .....Medal.

Best Churn—Cornell's improved zinc churn, S. T. Cornell, Jacksonville.... .....Medal.

Best Washing Machine—Adam S. Brown, Decatur.....Medal.

Best Washing and Wringing Machine—Monitor, Hanchett & Gill, Charleston, Coles county, Illinois.....Medal.

Awarding Committee.—Samuel Graham, Paris, Edgar county; David Sherman, Springfield; M. O. Wilson, Paris, Edgar county.

LOT 36.—MANUFACTURES OF VARIOUS KINDS.

Best display of Cooper's Work—W. A. Liston, Decatur.....Journal.

Best display of Light Harness Horse Collars—H. P. Wetzel, Chicago..... .....Journal.

Awarding Committee.—O. B. Nichols, Chairman, Carlyle, Clinton county; G. B. James, Bloomington; John T. Perrine, Carlyle, Clinton county.

CLASS G.

LOT 37.—FARM PRODUCTS.

H. S. Osburn, Pinckneyville, *Superintendent.*

Best sample White Winter Wheat, not less than one bushel—W. D. Vansant, Salem, Marion county.....$6
Second best, David Simms, Mt. Pulaski, Logan county..... 3

Best Sample of Spring Wheat, one bushel—Stillman Barber, Millmine, Piatt county... 6

Best sample of Rye, one bushel—Stillman Barber, Millmine, Piatt county..... 4

Best sample different varieties Indian Corn—Howard Badolet, Salem, Marion county.. 6
Second best, Stillman Barber, Millmine..... 3

Best sample of different varieties of Indian Corn, one bushel in ear—Howard Badolet, Salem, Marion county..... 3
Second best, Stillman Barber, Millmine.....Journal.

Best sample of Corn on the stalk—J. P. Huff, Salem, Marion county..... 2
Second best, Urial Mills, Salem, Marion county.....Journal.

Best sample Timothy Seed, one bushel—Urial Mills, Salem, Marion county..... 5

Best sample early Irish Potatoes, one bushel—Insane Hospital, Jacksonville 2

Best sample of late Irish Potatoes—Howard Badolet, Salem, Marion county..... 2
Second best, Insane Hospital, Jacksonville..... .....Journal.

Best lot of Onions, not less than one peck—S. Wilber, Momence, Kankakee county.... 1
Second best, Mrs. Susanna Tait, Decatur..... .....Journal.

Best Table Turnips, one bushel—S. Wilber, Momence..... 1

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Best lot of Pumpkins—W. D. Vansant, Salem, Marion county.....Journal

Best lot of Squashes—W. D. Vansant, Salem, Marion county..... 1
Second best, R. K. Lansden, Wilson.....Journal.

Best sample of Carrots, one bushel—Insane Hospital, Jacksonville..... 1
Second best, S. Wilber, Momence, Kankakee county.....Journal.

Best and greatest variety of Vegetables—S. Wilber, Momence, Kankakee county..... 4
Second best, Insane Asylum, Jacksonville..... 2

Best and greatest variety of Garden Seeds raised in Illinois—S. Wilber, Momence.... 2

Best sample of Tobacco, not less than 25 pounds, on the stalk—J. N. Fuller, Decatur.. 5

Awarding Committee.—Finis Evans, Chairman, Makanda, Jackson county; David Shanafeldt, Salem, Marion county; Wm. Robertson, Sparta, Randolph county; John M. Hunter, Ashley, Washington county.

LOT 38.—FLOUR, STARCH, ETC.

Best sample of Flour, one barrel, to be exhibited by the maker, with statement of the variety and quantity of wheat used to make it—Mansfield, Frees & Co., Decatur..... 3

Best Butter, made in May or June, not less than twenty pounds—Mrs. W. O. Jones, Decatur..... 1

Best Fresh Butter, in rolls, not less than ten pounds—Mrs. J. F. Scoch, Decatur..... 5
Second best, Mrs. Leah Imboden, Decatur.....Journal.

Best Cheese under one year old—Mrs. Elizabeth Bedford, Paris, Ky.....10
Second best, Charles Rosenstiel, Freeport, Stephenson county..... 5

Best New Cheese—Franklin Barnes, Bloomington..... 5

Best Bee Hive—Wm. Warren, Three Oaks, Berrian county, Michigan.....Medal.
Second best, H. P. Kidder, Burlington, Vermont.....Journal.

Best lot of Honey, not less than 10 pounds—G. W. Warren, Three Oaks, Berrian county, Michigan..... 5
Second best lot, A. F. Risley, Decatur..... 2

Best two Loaves of Bread, made with hop yeast—Insane Hospital, Jacksonville..... 3
Second best, Miss Mary Powel, Decatur..... 2

Best two Loaves of Bread from unbolted flour—Insane Hospital, Jacksonville..... 3

Best two Loaves of Bread from rye flour—Insane Hospital..... 3

Best two Loaves Corn Bread—Mrs. Elizabeth Maffit, Decatur..... 3

Best Sponge Cake—Miss Julia S. McDonald, Jacksonville..... 2

Best Pound Cake—Mrs. L. L. Haworth, Decatur..... 2

Best Jelly Cake—Miss Julia S. McDonald, Jacksonville..... 2

Best Fruit Cake—Insane Hospital, Jacksonville..... 2

Best Tomato Catsup—Mrs. L. L. Haworth, Decatur..... 1

Awarding Committee.—William Yates, Springfield, Chairman; William Addison, Sparta, Randolph county, John H. Crocker, Maroa, Macon county.

CLASS H.

LOT 39—FRUIT TREES AND FRUIT.

WM. S. WAIT, Greenville and CHARLES H. ROSENSTIEL, Freeport, *Superintendents.*

Best display of Fruit and Deciduous Ornamental Trees from Nursery—F. K. Phœnix, Bloomington.....$10

Best display of Ornamental Shrubs from Nursery—F. K. Phœnix, Bloomington..... 10

Best display of Hardy Evergreens—F. K. Phœnix..... 10

Best collection of Apples, not less than 25 varieties—A. Bryant & Son, Princeton.... 10
Second best, F. K. Phœnix, Bloomington..... 5

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Best display of 15 varieties of Apples, for cultivation in Southern Illinois, including Summer, Autumn and Winter—F. K. Phœnix, Bloomington.....$10
Second best, J. S. Galbraith, Mt. Vernon, Jefferson county..... 5

Best display of 15 varieties of Apples for cultivation in Northern Illinois, including Summer, Autumn and Winter—A. Bryant & Son, Princeton..... 10
Second best, F. K. Phœnix, Bloomington..... 5

Best collection of Summer, Fall and Winter Apples—Charles H. Rosenstiel, Freeport. 6
Second best, Stillman Barber, Millmine, Piatt county..... 3

Best collection of Pears—Wm. Yates, Tamaroa..... 5
Second best, James H. Crane, Undulation, Pulaski county..... 3

Best collection of Peaches—J. G. Morris, Oconee, Fayette county..... 5
Second best, J. S. Galbraith, Mt. Vernon, Jefferson county..... 3

Best twelve specimens of Quinces—A. W. Blakesly, Quincy, Adams county..... 3
Second best, S. Wickham, Decatur..... 2

Best and greatest variety of native cultivated Grapes, six bunches—Charles H. Rosenstiel, Freeport..... 8
Second best, Dr. H. Schroeder, Bloomington..... 4

Best and greatest variety of Foreign Grapes, grown under glass, six bunches—Dr. Chaffin, Tolono, who exhibited ten varieties..... 8

Best early Grapes—Dr. H. Schroeder, Bloomington..... 5
Second best, Charles H. Rosenstiel, Freeport..... 3

Best late Wine Grape, Norton's Virginia—Dr. H. Schroeder, Bloomington..... 5

Best late Table Grape—J. Stewart, Quincy, Adam's county..... 5
Second best late Grape, Mead's Seedling, John A. Pettingill, Bunker Hill..... 3

Awarding Committee.—J. T. Little Dixon, Lee county, Chairman; J. Huggins, Woodburne, Macoupin county; W. C. Flagg, Moro, Madison county; B. G. Roots, Tamaroa, Perry county; W. B. Tenbrook, Paris, Edgar county.

WINES.

At the request of the exhibitors, the samples of Wines on exhibition were examined by the Executive Committee, and the following awards made:

Best three bottles Catawba Wine, the product of this State—Dr. H. Schroeder, Bloomington.....$10

Best three bottles Herbemont Wine, the product of this State—To same..... 10

Best three bottles Wine from any other grape—Norton's Virginia Seedling—To same. 10

Best Cherry Wine—E. Tanner, Decatur..... 10

LOT 40—CANNED AND PRESERVED FRUITS.

Second best preserved Quinces in sugar—Mrs. Allinson, Macon.....$1

Best preserved Peaches in sugar—Mrs. Anderson, Decatur..... 2
Second best, Miss Julia S. McDonald, Jacksonville..... 1

Best preserved Plums in sugar—Mrs. W. Anderson, Decatur..... 2
Second best, Mrs. Susanna Tait, Decatur..... 1

Best preserved Pears in sugar—Mrs. S. Allinson, Macon..... 2
Second best, Mrs. J. J. Jones, Decatur..... 1

Best Crab Apple Jelly—Mrs. S. Allinson, Macon..... 2

Best Plum Jelly—Mrs. Anna B. Millikin, Decatur..... 2

Best Quince Jelly—Mrs. S. Allinson, Macon..... 2

Best Currant Jelly—Miss N. L. Bedford, Paris, Kentucky..... 2

Best Apple Butter—Mrs. Susanna Tait, Decatur..... 2

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LOT 41—FLOWERS AND PLANTS.

Best collection of Begonias—M. L. Dunlap, Champaign.....$3

Second best collection of distinct varieties of Green House Plants in bloom—M. L. Dunlap, Champaign..... 6

Second best collection of Fuschias in bloom—M. L. Dunlap, Champaign..... 2

Best collection of Pansies in bloom—M. L. Dunlap..... 2

Best and greatest display of Gladioli in bloom—F. K. Phœnix, Bloomington..... 1

Best and greatest display of Petunias—F. K. Phœnix..... 2
Second best, M. Doyle, Springfield.....Journal.

Best and greatest variety of Dahlias, named and in bloom—F. K. Phœnix..... 4

Best twelve Dissimilar Blooms—F. K. Phœnix, Bloomington..... 3

Second best and greatest variety of Roses in pots, in bloom—Mrs. J. M. Gardner, Decatur..... 3

Best and greatest variety Verbenas in bloom—F. K. Phœnix..... 2
Second best, M. L. Dunlap, Champaign .....Journal.

Second best and greatest variety of Astors in bloom—Mrs. M. Elson, Decatur...Journal.

Awarding Committee.—Samuel Hood, Springfield, Chairman; Mrs. Louisa Ravold, Greenville; Miss Lizzy Larrimore, Bloomington.

LOT 42—FLORAL DESIGNS AND BOUQUETS.

Best and most tastefully arranged Cut Flowers—F. K. Phœnix, Bloomington.....$2

Best and most tastefully arranged pair Round Bouquets—L. W. Minor, Decatur..... 2

Awarding Committee.—C. R. Overmann, Bloomington, Chairman; Lewis Ellsworth, Naperville; Mrs. Dr. Johns, Decatur; Miss Lizzy Finly, Chicago; Mrs. Frekardt, Circleville, Ohio; Mrs. Dr. King, Decatur.

CLASS I—FINE ARTS, ETC.

R. H. Holder, Bloomington, *Superintendent.*

LOT 43—MUSICAL INSTRUMENTS.

Best Square Piano Forte—W. B. Bradbury, New York city.....Medal.

Best Melodeon—H. T. Merritt & Co., Chicago.....Medal.

Best Flute—H. Gardner, Decatur.....Medal.

Best Violincello—H. Gardner, Decatur.....Medal.

Awarding Committee.—Wm. Duane Wilson, Desmoines, Iowa, Chairman; Mrs. Sweet, Peoria; Miss E. Larrimore, Bloomington; H. A. Adams, Sandwich, DeKalb county; E. N. Clark, South Pass, Union county.

LOT 44—SCULPTURE, PAINTING, DRAWING, ETC.

Best specimen of Sculpture—Charles N. Pike, Springfield.....Medal.

Best Carving in Wood—Wm. Martin.....Medal.

Best collection of Paintings in Oil—K. H. Fell, Bloomington.....Medal.

Best Wood Cut—Bond & Chandler, Chicago.....Medal.

Best specimen of Flowers, painted in Water Colors—Mrs. C. A. T. Green, Harris-

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CLASS K—TEXTILE FABRICS, SEWING AND KNITTING MACHINES.

A. J. Mattson, Prophetstown, *Superintendent.*

LOT 45—MILL AND HOUSEHOLD FABRICS.

Best ten yards Jeans—C. P. Burchfield, Sullivan, Moultrie county.....Medal.

Best display of Domestic Manufactures, Woolen Goods—C. P. Burchfield, Sullivan, Moultrie county.....$5

Best display of Domestic Manufactures, Linen Goods—Mrs. Elizabeth Maffit, Decatur.. 5
Second best, Mrs. E. H. Cass, Decatur..... 3

LOT 46—NEEDLE, SHELL AND WAX WORK.

Best Plain Knitting—Mrs. L. L. Haworth, Decatur.....$4
Second best, Mrs. M. Stacy, Jacksonville..... 2
Third best, Mrs. M. Stacy, Jacksonville..... 1

Best Plain Sewing—Miss Sallie Hamilton, Decatur..... 4

Best Crochet or Fancy Knitting Work—Mrs. Henry Bishop, Decatur..... 4
Second best, Miss Julia A. Poole, Decatur..... 2
Third best, Miss Caroline Colladay, Macon 1

Best and most tastefully executed Quilt, or Coverlet—Mrs. O. Fitzsimmons, Jacksonville..... 4
Second best, Mrs. Owens, Springfield..... 2
Third best, Miss Mary E. Cussins, Decatur..... 1

Best Lace Work or Hemstitch—Mrs. E. A. Stroh, Decatur..... 4
Second best, Mrs. VanDusen, Springfield..... 2

Best Worsted Embroidery—Mrs. M. M. VanDusen, Springfield..... 4
Second best, Mrs. Mary Scibird, Decatur..... 2
Third best, Miss Starr Mansfield, Decatur..... 1

Best Needle Work or Floss Embroidery—Mrs. E. A. Stroh, Decatur..... 4
Second best, Mrs. O. Fitzsimmons, Jacksonville..... 2
Third best, Mrs. M. M. VanDusen, Springfield..... 1

Best Silk Embroidery—Mrs. W. J. Brown, Decatur..... 4
Second best, Mrs. M. M. VanDusen, Springfield..... 2

Best and most tasteful display of work in Wax, Feathers, Hair, Crape, Spice, &c.—The first premium was equally divided between Mrs. G. S. Lyon, Decatur, and Mrs. L. Babcock, Springfield, Agricultural Wreath, made of seeds..... 4
Second Premium, Miss Mary Smith, Monticello..... 2
Third Premium, Mrs. N. Bedford, Paris, Kentucky..... 1

Best Shell, Leather, Beads, Mosaic, or Papier Mache Work—Mrs. C. E. Bryant, Kankakee 4
Second best, Miss Kate C. Goltra, Jacksonville..... 2
Third best, Mrs. J. A. Buckingham, Decatur..... 1

Awarding Committee.—Capt. E. H. Beebe, Chairman; Mrs. H. M. Mitchell, Quincy; Mrs. C. H. Franklin, Chicago; Mrs. A. B. Millikin, Decatur; Miss C. Kile, Paris.

LOT 47—SEWING AND KNITTING MACHINES.

Best Sewing Machine for general purposes, Grover & Baker—F. W. Ludlow, agent, Chicago and St. Louis.....Medal

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Best collection, illustrating the Geology of Illinois—Illinois Natural History Society, by C. D. Wilber, Bloomington..... 20

Best collection of Useful Minerals—Illinois Natural History Society, by C. D. Wilber. 20

Awarding Committee.—G. F. Wright, Chairman; A. H. Worthen, Warsaw, Hancock county; J. W. Powell, Chicago.

CLASS M.

C. W. Webster, Salem, *Superintendent.*

LOT 40—PLOWING AND SPADING MATCHES.

PLOWING MATCH FOR MEN.

First Premium awarded to E. C. Mills, Salem, Marion county.....$15
Second Premium, Wilkinson Furness, Ononwa, Iowa..... 10
Third Premium, R. K. Leasden, Wilson, Macon county..... 5

PLOWING MATCH FOR BOYS UNDER EIGHTEEN YEARS.

First Premium, E. G. Mills, Salem, Marion county..... 15
Second Premium, J. J. Webster, Salem, Marion county..... 10

Awarding Committee.—Samuel Graham, Paris, Edgar county; O. Poole, Shawneetown; C. Bagley, Uplands, Lee county; A. J. Pearcy, Centralia, Marion county; Wm. Battell, Quincy, Adams county.

MISCELLANEOUS.

CLASS F—Lot 31.

Combined Roller, Clod Crusher and Drill—By Charles E. Miller, Amelia, Clermont, county, Ohio. Commended.

One-Horse Hoe—By Messrs. Lincoln, Merion and Rich, Chicago, Ill. Commended.

[Note.—The exhibition of Reapers, Mowers and Headers in this Lot was very fine, but by a previously understood arrangement no trial was had and no awards made.]

CLASS F—Lot 32.

A Lifting Jack—By Thos. Dunham, of Mackinaw, Tazewell county, Ill. Commended.

Hay Knife—By same. Commended.

Sanford & Mallory's Patent Flax and Hemp Breaking Machine—By Nelson Stillman, Chicago, Ill. Very highly commended, and silver medal awarded by the Board.

Corn Basket—By J. P. Edie, Rockford, Ill. Commended, and silver medal awarded by the Board.

Four-Horse Power—By Dillman & Co., Joliet, Ill. Highly commended.

Circular Band Cutter—By A. J. Luckey, Janesville, Wis. Highly commended.

Improved Car Truck—By Thomas Wilson, Baily, Ogle county, Ill. Highly commended.

Grain Separator and Oat Extractor—By J. Furguson, Dubuque, Iowa. Highly commended, and silver medal awarded by the Board.

Corn Harvester—By L. D. Budlong, Kinmundy, Marion county, Illinois. Commended.

Grain Separator—By Vaughn & Co., Chicago. Highly commended.

CLASS F—Lot 33.

Ditching Machine—By M. F. Wickersham, Springfield, Ill. Highly commended.

Cattle Pump, for farm purposes—By J. F. Black and A. Brubaker, Lancaster, Cass county, Ill. Highly commended.

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Railroad Iron Straightener and Curver—By Daniel Bolton, Springfield, Ill. Highly commended.

CLASS F—Lot 34.

Model of Evaporator—By Joseph C. Andrews, Decatur, Ill. Highly commended.

Britton's Continuous Copper Strip Lightning Conductor—By N. Britton, Chicago, Ill. Worthy the highest consideration for simplicity of construction and ease of erection.

Dr. Hall's Patent Copper Scroll Lightning Rod—By Smith & Tanner, Chicago, Ill. Commended.

Combined Stove Cover Lifter and Holder—By J. W. Hawxhurt, Chicago, Ill. Highest commendation—very simple, cheap and effective.

Kerosene Crater for heating purposes—By J. W. Hawxhurst, Chicago, Ill. Highest commendation.

Improved Hemming Shield for hand sewing—By J. W. Hawxhurst, Chicago, Ill. Highest commendation, and especially recommended to the notice of ladies.

Flexible Shawl and Nursery Pin—By J. W. Hawxhurst, Chicago, Ill. Commended.

Letter and Invoice Filer—By J. W. Hawxhurst, Chicago, Ill. Highly commended.

Wonder Kerosene Burner—By D. Bruton, Chicago, Ill. Highly commended.

CLASS F—Lot 35.

Model of Portable Fence—By A. C. Cornman, Decatur, Ill. Commended.

Haw's Patent Portable, Elevating, Folding and Revolving Clothes Dryer—By Geo. H. Page, Chicago, Ill. Highly commended.

Ironing Stand, comprising bureau, lounge and sofa—By Miss M. L. Bevens, Atlanta, Ill. Highly commended.

Ice Cream Freezer—By Hamilton & Ashton, Jacksonville, Ill. Highly commended.

Universal Clothes Wringer—By C. Williams, Beloit, Wis. Highly commended.

Patent Elastic Spring Coupling for Vehicles—By G. S. Manning, Springfield, Ill. Highly commended.

Sulky—By Thos. H. Brown, Novelty Carriage Works, Chicago, Ill. Highly commended.

Brake for any Wagon—By J. Sager, Belvidere, Ill. Commended.

Improvement in Wagon Wheels, on running gear of two-horse wagons—By John Kirkman, Peoria, Ill. Commended.

Skeleton Wagon—By Thos. H. Brown, Novelty Carriage Works, Chicago, Ill. Commended as excellent material and workmanship.

CLASS F—Lot 36.

Alphabet Box—By J. F. Schock, Decatur, Ill. Highly commended.

Wooden Burial Cases—By S. D. Sprague, Haydenville, Mass. Highly commended.

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Potatoes from seed—By Hospital for Insane, Jacksonville, Ills. Commended.

Sage, Savory, Parsley and Celery—By same. Commended.

Sweet Corn--By S. Wilber, Momence, Ills. Commended.

Lot of Spring Wheat—By B. Lester, of Ringwood, Ills. Commended.

Sample (15 pounds) manufactured Tobacco—By James P. Bohannan & Co., Anna, Ills. Highly Commended.

Sample of Chinese Sugar Cane Sirup—By B. Garrettson, Tonica, Ills. Commended.

Sample of Rhubarb Stalks—By Stillman Barber, Millmine, Ills. Commended.

Sample of Cotton—By Jas. H. Crain. Commended.

CLASS G—Lot 38.

Silver Cake—By Mrs. A. C. Cornman, Decatur, Ills. Commended.

Gold Cake—By same. Commended.

Marble Cake—By same. Commended.

Bottle of Honey, forty-four years old—By Mrs. E. A. Stroh, Decatur. Commended as well preserved.

Cookies—By Miss Mary Powell, Decatur, Ills. Commended.

CLASS H—Lot 40.

Perpetual bearing Raspberries—by E. Tanner, Decatur, Ills. Commended.

Cincinnati Red Raspberries—By same. Commended.

Catawba Grape Jelly—By Mrs. G. H. Kates, Decatur, Ills. Commended.

Blackberry Jelly—By same. Commended.

Canned Blackberries—By Mrs. Sarah Allinson, Decatur. Commended.

Apple Jelly—By Mrs. E. A. Jones, Decatur, Ills. Commended.

Crab Apple Preserves—By Miss N. L. Bedford, Paris, Ky. Commended.

Grape Jelly—By Mrs. J. J. Jones, Decatur, Ills. Commended.

Tomato Butter—By Mrs. E. Bowen, Decatur, Ills. Commended.

Apple Jelly—By Miss Julia S. McDonald, Jacksonville, Ills. Commended.

Bottle of Cherries—By same. Commended.

Bottle of Blackberries—By same. Commended.

CLASS H—Lot 39.

Samples of 78 varieties of Pears, (not competing)—By Ellwanger & Barry, Rochester, N. Y. Highly commended.

Grape Vines grown in pots—By H. Schroeder, Bloomington, Ills. Commended highly.

CLASS H—Lot 41.

Collection of Geraniums—By M. L. Dunlap, Champaign, Ill. Commended.

CLASS H—Lot 42.

Lot of Canary Birds—By Thomas Harvey, Pana, Ills. A very large and fine lot of birds, the cage most beautifully and tastefully arranged. Highest commendation.

CLASS I—Lot 43.

Case of Dental Specimens—By Dr. C. J. Dennis, Peoria, Ills. Commended.

Cabinet Organ—By Mason & Hamlin, Boston, Mass. Highly commended.

Accordeon—By H. Gardiner, Decatur, Ills. Commended.

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CLASS I—LOT 44.

Crayon Drawings—By Mrs. O. Z. Green, Harristown, Ills. Recommended by the committee as worthy of special notice.

Specimens of Graining, in imitation of wood and marble—By Thomas Hart, Springfield. Commended as extraordinary imitations.

CLASS K—LOT 45.

Manufactured Goods—By Stamper, Condell & Co., Decatur, Ills. Commended highly.

Display of Woolen Mill Fabrics—By Boyd, Haskell & Co., Decatur, Ills. Commended.

Piano Cover—By Mrs. Julia M. Gardiner, Decatur, Ills. Highly commended.

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WINTER MEETING OF EXECUTIVE BOARD.

JANUARY 9, 1864.

PREMIUMS AWARDED.

For the best Market Garden—To Dr. H. Schroder, of Bloomington, McLean Co...$20

For the best Apple Orchard—To S. R. Hurd, of Woodside, Sangamon county.... 15

For the best Essay on "the In-door adornment of Home"—To Mrs. J. R. Woods, of Upper Alton..... 10

The Essays of Miss Sarah E. Rumsey, and of Mrs. Frank C. Edwards, on the same subject, were highly commended, and (the consent of the authoresses being first obtained) ordered to be published in the next volume of Transactions.

[Mrs. Edwards has not consented to permit the publication of the Essay presented by her.—*Sec'y.*]

An Essay on "the Education of Farmer's Daughters," by Miss Mary E. Murtfeldt, of Rockford, was read, highly commended, and (the consent of the authoress being first obtained) ordered to be published in the next volume of Transactions.

For the best three bottles of Catawba Wine—To Dr. H. Schroder, of Bloomington.....$10

For the best three bottles of Isabella Wine—To Dr. H. Schroder, of Bloomington.. 10

For the best three bottles of wine from any other grape—To Dr. H. Schroder, of Bloomington, for wine made from the Delaware grape..... 10

For the best Strawberry Wine—To Thos. Bradbury, of Griggsville, Pike county.. 3

For the best six bottles of Vinegar—To S. R. Hurd, of Woodside, Sangamon Co.. 3

For the best Morello Cherry Wine—To Thos. Bradbury, of Griggsville, Pike county, discretionary premium..... 3

Award of premiums continued March 12, 1864:

For the best gallon of Sirup made from Chinese Sugar Cane—To Thomas Bradbury, of Griggsville, Pike county..... 10

For the best gallon of Sirup made from African Sugar Cane (Imphee)—To J. H. Smith, of Quincy, Adams county..... 10

For the best Cheese under one year old—To Chas. H. Rosenstiel, of Freeport, Stephenson county 10

For the best Fresh Butter in rolls—To Chas. H. Rosenstiel, of Freeport, Stephenson county..... 10

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STATEMENTS OF FIELD CROPS, ETC.

STATEMENTS OF S. W. ARNOLD.

Statement of S. W. Arnold, of Cortland, DeKalb Co., Illinois, on Field Crops raised by him and entered for premiums with the Illinois State Agricultural Society, December 1, 1868.

WHEAT.

The land on which wheat was raised the past season, and the same surveyed by D. W. Lamb and described by survey bill herewith forwarded, is high, rolling prairie, seven years under cultivation; one crop of barley and six of wheat; the previous crop was wheat; no manure, except the straw of one crop of wheat burned on the ground; plowed early last fall; sowed the fore part of April, as soon as the weather would permit; one and a half bushels seed per acre, with Cahoon's broad cast sower; variety, China Tea; dragged and cross dragged, and rolled; quantity of land, five 28-100 acres; number of bushels, measured in a sealed half bushel, one hundred and four and one-half. The expense of the crop was as follows:

Plowing, 3 days, dragging and rolling, 2 days, $2	$10 00
Sowing, 50 cts., 8 bushels seed, $1,—$8 00	8 50
Harvesting and stacking, $2 per acre	10 56
Threshing, 8 cts. per bushel, marketing, 2 cts	10 43
	$39 49

Cr.

By 104½ bushels of wheat, worth now at R. R. station $1 . . $104 50

CORN.

The land on which the Corn crop was raised, and described in

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Five bushels of ears taken at random out of crib the 20th of November, (an average lot,) shelled and measured in a sealed half bushel; quantity, three bushels and three lbs., (the lbs. weighed with steelyards); amount of shelled corn grown on the piece, two hundred and ninety-nine bushels and one-half, rejecting small fractions.

I did not notice the new regulations respecting the measurement of the corn crop, until a considerable part of my crop was harvested, which rendered it impossible to comply strictly with instructions.

The expense of the corn crop was as follows:

Dr.

Plowing and dragging, $1 25 per acre	$8 75
Planting and rolling, 5 men and team one day, at $1	6 00
Seed	1 00
Working 5 times, 1 day each time	7 50
Harvesting, $2 per acre	14 00
Shelling and marketing, 4 cts. per bushel	12 00
	$49 25

Cr.

By 299½ bushels corn, now worth 80 cts. per bushel	$239 60

—

POTATOES.

The ground on which the potatoes were raised, the same surveyed and described by D. W. Lamb, in survey bill, is rather flat, mucky soil, mixed considerably with sand washed on from a sand hill near by; six years under cultivation in wheat and barley; plowed in fore part of May; dragged; marked three and a half feet, and planted two feet between hills; seed cut into pieces containing two eyes on each piece, and two pieces in each hill; furrowed rather deep; worked once with cultivator and once with plow, turning furrow towards the plants; quantity of land, 50.100 5-10 of an acre; number of bushels, one hundred and sixty-three; variety, Peachblow.

Expenses of the crop as follows:

Plowing, dragging, rolling and marking land, 1 day	$2 00
Five bushels seed, 75 cts	3 75
Planting	[illegible]

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TURNIPS.

Raised on high land, descending to the south; has been moderately manured in previous years; preceded this season by a crop of early peas; sown about 25th of July; ground plowed, dragged and sown immediately; covered by rolling; sown broad cast; hand hoed once; land 41-100 of an acre.

Whole expense of raising, about	$3 03
Pulling and marketing	8 00
	$11 00

CR.

110 bushels sold, at an average of 33 cts. per bushel	$36 00
10 bushels kept at home at 33 cts. per bushel	3 30
	$39 60

Variety, White Flat Dutch, and Red Top Strap Leaf.

—

DeKalb County, ss.

S. W. Arnold, being duly sworn, says that he raised crops of Wheat, Corn, Potatoes and Turnips the past season, on the pieces of land surveyed by Daniel W. Lamb, and that the quantities and values are as stated above, and that he was assisted in harvesting and measuring said crops by Irwin R. B. Arnold, Thomas Arnold, and Lewis B. Wager; that the statements annexed, as to the manner of cultivation, expense, etc., are, in all respects, true, to the best of his knowledge and belief; and the samples exhibited are fair average samples of the crop. S. W. ARNOLD.

Subscribed and sworn to before me this 8th day of December, 1863.

AMOS D. BROWN, *Justice of the Peace.*

—

DeKalb County, ss.

Irwin R. B. Arnold, Thomas Arnold, and Lewis B. Wager, being duly sworn, say, that they assisted S. W. Arnold in harvesting, getting out and measuring the crops of Wheat, Corn, Potatoes and Turnips, referred to in the above statements, and that the quantities, mode of cultivation, etc., as there stated, are true, and they were grown on the lots of land surveyed by D. W. Lamb.

IRWIN R. B. ARNOLD,
THOMAS B. ARNOLD,
LEWIS O. WAGER.

Sworn to before me this 8th day of December, 1863.

AMOS D. BROWN, *Justice of the Peace.*

—

DeKalb County, ss.

Daniel W. Lamb, being duly sworn, says he is a Surveyor; and that he has surveyed, with chain and compass, several pieces of land upon the farm of S. W. Arnold, and on which he raised crops the present year, and the quantities of land are as follows:

That on which Spring Wheat was grown contains five acres 23-100, and no more; that on which Corn was grown contains seven acres, and no more; that on which Potatoes were grown contains 50-100 5-10 of an acre, and no more; that on which English Turnips

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STATEMENT OF S. W. ARNOLD.

SPRING WHEAT.

Special Premium of Ball's Combined Reaper and Mower was awarded to S. W. Arnold, of Cortland, DeKalb county, for best twenty acres of spring wheat.

The following is the statement of the manner and cost of raising twenty-six 64.100 acres of spring wheat during the season of 1862:

My farm lies in the town of Pierce, county of DeKalb. The land on which this wheat was raised is gently rolling prairie, the field being considerably highest near the centre, and descending on three sides, as near to slough land as it is practicable to raise wheat. The plowing was done in the autumn previous, with a good two-horse team, depth from five to eight inches. This crop is the fifth raised on the land since breaking, four of which were wheat and one corn on a part, and on the other part the whole five were wheat. The wheat was sown the last week in March and the first week in April, on the furrows, with Cahoon's Broadcast Sower, at the rate of 1½ bushels per acre, and dragged across the furrows once over and cross dragged, lapping the drag one half. The ground being wet, rolling was omitted. The part of the field first sown was the best. Variety China Tea. The land has never been manured, except by burning the straw of previous crops upon it.

The expenses of cultivating and harvesting are as follows:

Plowing, $1 per acre	$26 64
Sowing and dragging at 40c	10 66
Reaping, 62½c.; binding and shocking, 62½.: $1 25	33 30
Stacking, 40c per acre	10 66
Threshing 436 bushels at 8c. per bushel	34 88
Cleaning and marketing 3c. per bushel	13 08
Total cost	$129 22
Sold at an average of 75c. per bushel	$327 00

The above prices are what I could have hired others to have done the labor and boarded themselves for, except the binding, shocking and part of the threshing, which was performed by myself and family, and laborers hired by the month at much less than ordinary wages by the day.

S. W. ARNOLD.

DeKalb County ss.

S. W. Arnold, being duly sworn, says that he raised a crop of spring wheat upon land surveyed by Daniel W. Lamb the past season, and the quantity of grain grown thereon was four hundred and thirty-six bushels, partly weighed and partly measured in a sealed half bushel, and that he was assisted in harvesting and measuring said crop by Charles M. Downs, Gilbert L. Arnold and Irwin R. Arnold; that the statement annexed subscribed by this deponent as to the manner of cultivation, expense, etc., is, in all respects, true to the best of his knowledge and belief, and the sample of grain exhibited is a fair average sample of the whole crop.

S. W. ARNOLD.

Sworn to before me this 11th day of December, 1862.

ABRAM CONANT, J. P.

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DeKalb County, ss.

Charles M. Downs, Gilbert L. Arnold, and Irwin R. Arnold, being duly sworn, say they assisted S. W. Arnold in getting out, harvesting and measuring his crop of wheat, referred to in the above affidavit, and that the quantity of grain was four hundred and thirty-six bushels, and was grown upon ground, as stated in the affidavit of S. W. Arnold.

G. L. ARNOLD,
I. R. ARNOLD,
C. M. DOWNS.

Sworn to before me this 2d day of December, 1862. ABRAM CONANT, J. P.

DeKalb County, ss.

Daniel W. Lamb, being duly sworn, says he is a surveyor; that he surveyed with chain and compass the land upon which S. W. Arnold raised a crop of spring wheat the past season; that the land is in one contiguous piece, and the quantity is twenty-six 64.100 acres and no more. DANIEL W. LAMB.

Sworn to before me this 8th day of December, 1862. ABRAM CONANT, J. P.

[The above statement was accidentally omitted from among those presented at the Winter Meeting, January, 1863.]

STATEMENT OF S. R. HURD.

ORCHARDS.

WOODSIDE, Sangamon County, Ill., *December*, 31, 1863.

My farm is situated six miles south of Springfield, on the St. Louis, Alton and Chicago railroad. My farm is level, situated on the north side of timber, with a black prairie soil, having a clay sub-soil, with descent enough to drain my orchard. I plow as deep as I can, throwing the soil into ridges twenty-one feet apart. On these ridges I plant my trees, twenty-one feet apart in the rows, by digging the holes according to the age and size of my trees, (for I have planted of all ages and sizes.) As a general rule, if my tree is three years old, three feet over and two spade blades deep will do; always putting the top soil around the roots. A six year old tree should have a hole six feet over. I have had many such bear the same year of transplanting. I always mulch and water, if necessary. I am particular in selecting trees, so that there is the least fault to be found with them in regard to productiveness, quality of fruit, and as long keepers. I pay five cents more for choice of trees, rather than have whipstalks given me. I start the heads of all upright growers within two feet of the ground; others one foot higher. I commenced planting eight years ago, on the farm where I now live, and have been particular in selecting choice fruit ever since my boyhood. I have five acres of orchard, with two hundred

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Westfield Seeknofurther, Swaar, Prior's Red, Baldwin, Northern Spy, Jonathan, Yellow Bellflower, Fameuse, Newtown Pippin, Peck's Pleasant, American Golden Russet, Poughkeepsie Russet, Raule's Janet, Dominie, Willow Twig, White Pippin, Wagoner, Red Cheek Pippin, Little Romanite, Wine Sap, Hubbardston's Nonesuch, Tallman's Sweet, Ladies' Sweet, Honey Sweet, of New York, Sweet Romanite.

For a list of such varieties as have proven most profitable for market, I submit the following: Fall Pippin, Rambo, Fall Wine, Carolina June, Early Harvest, Baldwin, Rhode Island Greening, Wine Sap, Esopus Spitzenburg, Domine, Raule's Janet, Willow Twig.

For a list of the six best, and three best varieties of winter apples, I give the following:

Best.—Domine, Winesap, Raule's Janet, Willow Twig, Newtown Pippin, Golden Russet.

Winter.—Domine, Winesap, Raule's Janet.

I keep my apples in barrels, in an out-room, until there is danger of frost; I then pick them over carefully, and move them into my fruit cellar, which is thirty by eighteen. A frame work, of four feet wide, with shelves on it, of convenient distance apart, with sides six inches high, runs through the center of my cellar, thus giving me a good chance to pick over and assort my apples, by passing around the shelves.

SILAS R. HURD.

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OFFICIAL LIST OF AWARDS

AT THE ILLINOIS STATE FAIR OF 1864.

CLASS A—CATTLE.

S. B. CHANDLER, Belleville, *Acting Superintendent.*

LOT 1—SHORT HORN BULLS.

BULLS FOUR YEARS OLD AND OVER.

First Premium to "Master Mason," Samuel Suver, Monticello.....$25
Second Premium to "Lord Highland," J. H. Pickrell, Harristown..... 15

BULLS THREE YEARS OLD AND UNDER FOUR.

First Premium to "Grand Duke of Airdrie," James M. Hill, Harristown..... 25
Second Premium to "White Count," A. Eyman, Harristown..... 15

BULLS TWO YEARS OLD AND UNDER THREE.

First Premium to "Woodford," Wm. Sandusky, Indianola..... 25
Second Premium to "Geo. B. McClellan," H. Sandusky, Indianola..... 15

BULLS ONE YEAR OLD AND UNDER TWO.

First Premium to "Woodburne Duke," Jas. N. Brown, Berlin..... 25
Second Premium to "Mortimer," Wm. H. Beverly, Atlanta..... 15

BULL CALF UNDER ONE YEAR OLD.

First Premium to "J. W. Singleton," J. M. Hill, Harristown..... 25
Second Premium to "Highland Duke," Jas. M. Hill, Harristown..... 15

Awarding Committee.—Geo. M. Chambers, Stephen Ogden, Abijah Powers, Cyrus Jones, M. L. Sullivant.

LOT 2—SHORT HORNS—COWS AND HEIFERS.

COWS FOUR YEARS OLD AND OVER.

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COWS TWO YEARS OLD AND UNDER THREE.

First Premium to "Countess," Jas. N. Brown, Berlin.....$25
Second Premium to "Lady Jones," J. M. Hill, Harristown..... 15

HEIFERS ONE YEAR OLD AND UNDER TWO.

First Premium to "White Lady," J. M. Hill, Harristown..... 25
Second Premium to "Mary Childs," J. H. Pickrell, Harristown..... 15

HEIFER CALF UNDER ONE YEAR OLD.

First Premium to "Lady Francis," J. M. Hill, Harristown..... 25
Second Premium to "Miami 6th," J. B. Ryburn, Bloomington..... 15

Awarding Committee.—Geo. M. Chambers, Jacksonville; Thomas Millikin, Toronto, Indiana; Stephen Ogden, Paris; Jas. R. Hammet, Camargo; Abijah Powers, Gap Grove; John Claybaugh, Carlyle.

LOT 3—DEVONS.

BULLS FOUR YEARS OLD AND OVER.

First Premium to "Duke of Wales," W. H. Locke, Philo.....$25
Second Premium to "Glaucus," H. C. Johns, Decatur..... 15

BULLS ONE YEAR OLD AND UNDER TWO.

First Premium to "Gen. Grant," C. L. Pate, Catlin..... 25
Second Premium to "Forrester," Wm. H. Locke, Philo..... 15

COWS FOUR YEARS OLD AND OVER.

First Premium to "Broadhorn," Wm. H. Locke, Philo..... 25
Second Premium to "Beauty," C. L. Pate, Catlin..... 15

COWS THREE YEARS OLD AND UNDER FOUR.

First Premium to "Miss Quarterly," W. H. Locke, Philo..... 25
Second Premium to "Pink," C. L. Pate, Catlin..... 15

HEIFERS TWO YEARS OLD AND UNDER THREE.

First Premium to "Miss Curley," C. L. Pate, Catlin..... 25
Second Premium to "Flower 2d," W. H. Locke, Philo..... 15

HEIFER ONE YEAR OLD AND UNDER TWO.

First Premium to "Cherry 3d," W. H. Locke, Philo..... 25
Second Premium to "Miss Boucher," C. L. Pate, Catlin..... 15

HEIFER CALF UNDER ONE YEAR OLD.

First Premium to "Rose," W. H. Locke, Philo..... 25
Second Premium to "Topsy," C. L. Pate, Catlin..... 15

LOT 5—GRADES AND CROSSES.

COWS THREE YEARS OLD AND OVER.

Premium to "Milk Maid," J. H. Pickrell, Harristown $15

HEIFER ONE YEAR OLD AND UNDER TWO.

Premium to "Dora," J. H. Pickrell, Harristown..... 15

HEIFER CALF UNDER ONE YEAR OLD.

Premium to "Crocus," J. H. Pickrell, Harristown..... 10

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LOT 7—WORK OXEN AND STEERS.

YOKE OXEN OVER FOUR YEARS OLD.

Premium to J. M. Hill, Harristown.....$10

Boy not over 16 years old, best trained yoke of steers, over two years old and under three, Augustus Bair, Decatur..... 10

Awarding Committee for Lots 3, 5 *and* 7.—James R. Hammet, Chairman, Camargo; David Simkins, Belfast, Ohio; H. H. Beedle, Summerfield.

LOT 8—SWEEPSTAKES.

BULL AND FIVE COWS OR HEIFERS, ONE YEAR OLD AND UPWARDS, FROM ONE COUNTY.

First Premium to James N. Brown, Berlin.....$50
Second Premium to J. M. Hill, Harristown..... 25

FIVE HEAD OF CALVES, MALE AND FEMALE, UNDER ONE YEAR OLD, AND FROM ONE COUNTY.

First Premium to J. M. Hill, Harristown..... 40
Second Premium to J. H. Pickrell, Harristown..... 20

BEST COW OR HEIFER OF ANY AGE.

Premium to "Countess," James N. Brown, Berlin..... 50

BEST BULL OF ANY AGE.

Premium to "Millington," James N. Brown, Berlin..... 50

HERD OF NOT LESS THAN ONE BULL AND FIVE FEMALES, DROPPED AND REARED IN THIS STATE, AND OWNED BY ONE INDIVIDUAL.

Premium to J. H. Pickrell, Harristown..... 50

Awarding Committee.—W. R. Duncan, Chairman, Towanda; W. B. Foreman, Nashville; E. D. Garrard, Paris, Ky.; Jas. R. Hammet, Camargo; David Simkins, Belfast, Ohio; G. W. Frink, Bloomington. Mr. E. D. Garrard withdrew after the ring of bulls was examined.

CLASS B—HORSES.

C. W. Webster, Salem, *Acting Superintendent.*

LOT 9—THOROUGH BREDS.

STALLION FOUR YEARS OLD AND OVER.

First Premium to "Young Barnton," Bell Watkins, Springfield.....$25
Second Premium to "Gray Eagle," W. D. Bonta, Pleasureville, Ky..... 15

STALLION OVER TWO YEARS OLD AND UNDER THREE.

First Premium to "Tornado," W. H. Hartley & Co., Jacksonville..... 25
Second Premium to "Lamplighter," W. D. Bonta, Pleasureville, Ky..... 15

STALLION OVER ONE YEAR OLD AND UNDER TWO.

Premium to "Lightning," Joseph Morton, Jacksonville..... 25

STALLION, SUCKING COLT.

First Premium to "Engineer," Joseph Morton, Jacksonville..... 25
Second Premium to "Granby," E. Davis, Bement..... 15

THOROUGH BRED MARES.

MARES FOUR YEARS OLD AND OVER.

First Premium to "Cinderella," E. Davis, Bement, Piatt county, Ill.....$25
Second Premium to "Carenna," Joseph Morton, Jacksonville..... 15

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FILLY THREE YEARS OLD AND UNDER FOUR.

Premium to "Cinderella," E. Davis, Bement, Ill.....$25

FILLY TWO YEARS OLD AND UNDER THREE.

First Premium to "Bell Anna," Henry Hedges, Indianola, Ill..... 25
Second Premium to "Victory," W. T. Baker, Mt. Auburn, Christian county, Ill... 15

FILLY ONE YEAR OLD AND UNDER TWO.

Premium to "Mary Taylor," Joseph Morton, Jacksonville, Ill..... 25

Awarding Committee.—Thomas Smith, Springfield; P. Melendy, Cedar Falls, Iowa; Wm. S. Spafford, Des Moines, Iowa.

LOT 10—ROADSTERS.

STALLIONS FOUR YEARS OLD AND OVER.

First Premium to "Membrino Whip," E. L. Hall, Chicago, Ill.....$25
Second Premium to "Forest Temple," J. F. Love, Paris, Ill..... 15

STALLIONS THREE YEARS OLD AND UNDER FOUR.

First Premium to "Robert Pruit," E. L. Hall, Chicago..... 20
Second Premium to "Isaac Shepherd," E. L. Hall, Chicago..... 10

STALLIONS TWO YEARS OLD AND UNDER THREE.

First Premium to "Membrino," C. B. Carpenter, Tolono... 20
Second Premium to "Monarch Jim," S. R. Wheeler, Decatur, Ill..... 10

STALLIONS ONE YEAR OLD AND UNDER TWO.

Premium to "White Mountain," W. H. Beverly, Atlanta, Logan county, Ill..... 20

HORSE COLT ONE YEAR OLD.

Premium to "Dick," John Laubin, Bloomington..... 20

MARES FOUR YEARS OLD AND OVER.

First Premium to "Lady Florence," Snyder & Adams, Mt. Sterling, Brown county, Illinois..... 20
Second Premium to "Jenny," John Slaughter, Decatur, Ill..... 15

MARES THREE YEARS OLD AND UNDER FOUR.

First Premium to "Grace Greenwood," John Duer, Jacksonville, Ill..... 15
Second Premium to "Annie Lightner," David Campbell, Hayworth, McLean county, 10

FILLIES TWO YEARS OLD AND UNDER THREE.

Premium to "Gray Diomede," D. M. Froman, Decatur, Ill..... 15

FILLIES ONE YEAR OLD AND UNDER TWO.

First Premium to "Red Bird," Joseph Morton, Jacksonville, Ill..... 15
Second Premium to "Fanny," John Laubin, Bloomington, Ill..... 10

MARE COLTS UNDER ONE YEAR OLD.

Premium to "Ginger," E. D. Coleman, Clinton, DeWitt county, Ill..... 10

Awarding Committee.—M. T. Smith, Cynthiana, Ky.; P. Melendy, Cedar Falls, Iowa; M. P. Robinson.

LOT 11—HORSES OF ALL WORK.

STALLIONS OVER FOUR YEARS OLD.

First Premium to "Yellow Jacket," John D. Herriot, Mahomet, Ill.....$25
Second Premium to "Shakspeare, jr.," Bonta & Lawrence, Pleasureville, Ky..... 15

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STALLIONS OVER THREE YEARS OLD AND UNDER FOUR.

First Premium to "Charlie," Sam'l P. Earp, Lovington, Moultrie county, Ill.....$20
Second Premium to "Tom," Jacob Garver, Decatur, Ill..... 10

STALLIONS OVER TWO YEARS OLD AND UNDER THREE.

First Premium to "Lexington," W. D. Bonta, Pleasureville, Ky..... 20
Second Premium to "Bill," John Laubin, Bloomington, Ill..... 10

STALLIONS OVER ONE YEAR OLD AND UNDER TWO.

First Premium to "Young America," James Irvine, Coulterville, Perry county, Ill.. 20
Second Premium to "Nameless," John Slaughter, Decatur..... 10

Awarding Committee—P. Melendy, Cedar Falls; M. T. Smith, Cynthiana, Ky.; B. E. Deyo, Dixon, Ill.; Chas. S. Spafford, Des Moines, Iowa; T. S. Adams, Mt. Sterling, Illinois.

BROOD MARES.

BROOD MARES OVER FOUR YEARS OLD.

First Premium to "Lucy Walker," G. M. Caldwell, Williamsville.....$20
Second Premium to "Polly," Wm. Shumate, Springfield 10

FILLY OVER THREE YEARS OLD AND UNDER FOUR.

First Premium to "Molly," W. D. Bonta, Pleasureville, Ky..... 20
Second Premium to "Cynthia Anne," George Wolf, Bement 10

FILLY OVER TWO YEARS OLD AND UNDER THREE.

First Premium to "No name," G. Bates, Tuscola..... 20
Second Premium to "Amanda," Wm. H. Poore, Blueville..... 10

FILLY OVER ONE YEAR OLD AND UNDER TWO.

First Premium to "Fashion," W. S. Ladd, Taylorville... 20
Second Premium to "Jennie," E. D. Coleman, Clinton..... 10

SUCKING HORSE COLT.

Premium to "George," T. N. White, Niantic..... 20

SUCKING MARE COLTS.

First Premium to "Fancy," John D. Herriot, Mahomet..... 20
Second Premium to James Fowler, Decatur..... 10

Awarding Committee.—Peter Melendy, Chairman, Cedar Falls, Iowa; George D. Brown, Morrison; John McConnell, Rome; John Cunningham, Salem; C. S. Spafford, Des Moines, Iowa.

LOT 12—DRAUGHT HORSES.

STALLIONS OVER FOUR YEARS OLD.

First Premium to "North America," M. Saxon, Sparta..... .....$25
Second Premium to "Louis 2nd," Adolphus Dillon, Boynton..... 15

STALLIONS OVER THREE YEARS OLD AND UNDER FOUR.

First Premium to "Interest," Isaiah Dillon, Boynton..... 20

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BROOD MARES OVER FOUR YEARS OLD.

First Premium to "Fly," Isaiah Dillon, Boynton.....$20
Second Premium to "Hattie," Levi Dillon, Boynton..... 10

FILLY OVER THREE YEARS OLD AND UNDER FOUR.

Premium to "Margaret," Ellis Dillon, Boynton..... 20

FILLEY OVER TWO YEARS OLD AND UNDER THREE.

First Premium to "Amanda," Isaiah Dillon, Boynton 20
Second Premium to "Prairie Queen," Gavin Bicket, Sparta..... 10

SUCKING COLT, HORSE OR MARE.

First Premium to mare colt, Gavin Bicket, Sparta..... 20
Second Premium to stallion colt, H. G. Fisher, Armington..... 10

Awarding Committee.—P. Melendy, Cedar Falls, Iowa; George D. Brown, Morrison; John McConnell, Rome; John Cunningham, Salem; C. S. Spafford, Des Moines, Iowa.

LOT 13—CARRIAGE AND SADDLE HORSES.

SADDLE STALLIONS OVER THREE YEARS OLD.

First Premium to "Sir Alfred," R. M. Adair, Tallula.....$20
Second Premium to "Denmark," C. E. Bosworth, Mt. Auburn..... 10

SADDLE MARES OVER THREE YEARS OLD.

First Premium to "Rose," John Nuckles, Springfield..... 20
Second Premium to "Kate McLellan," W. D. Bonta, Pleasureville, Ky..... 10

SADDLE GELDINGS OVER THREE YEARS OLD.

First Premium to "Cy," Henry Hedges, Indianola..... 20
Second Premium to "Paddy Burns," John McGredy, Springfield..... 10

CARRIAGE MARES OVER THREE YEARS OLD, IN HARNESS.

First Premium to B. E. Deyo, Dixon..... 50
Second Premium to G. W. Long, Taylorville..... 30

CARRIAGE GELDINGS OVER THREE YEARS OLD, IN HARNESS.

First Premium to H. S. Byington, Quincy..... 50
Second Premium to J. B. Ricks, Taylorville..... 30

Awarding Committee Saddle Horses.—N. W. Cole, Amboy; Colton Bayley, Dixon; J. D. Smith, Berlin; John Jones, Aurora; John Cunningham, Salem.

Awarding Committee Carriage Horses.—Peter Melendy, M. W. Robinson, John Jones, John G. White, J. E. McCoy.

LOT 14—SWEEPSTAKES.

COLTS THREE YEARS OLD OR UNDER, NOT LESS THAN FIVE IN NUMBER, FROM ANY ONE TOWN OR COUNTY.

First Premium to Joseph Morton, Jacksonville.....$50
Second Premium to Dillon & Co., Boynton..... 25

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STALLION, TO BE SHOWN BY THE BRIDLE, SPEED NOT TO BE TESTED.

Premium to "Shakspeare, jr.," Bonta & Lawrence, Pleasureville, Ky.... .....$50

SADDLE STALLION, MARE OR GELDING.

First Premium to stallion "Sir Alfred," R. M. Adair, Tallula..... 50
Second Premium to stallion "Drennon," W. D. Bonta, Pleasureville, Ky..... 25

Awarding Committee.—H. Prather, Decatur; Wm. Broaddus, Douglas county; John Dement, Dixon; Amos Duffield, Sandoval.

LOT 15—JACKS, JENNETS AND MULES.

JACKS FOUR YEARS OLD AND OVER.

First Premium to "Pyrennees," John McConnell, Rome, Jefferson county, Ill.....$25
Second Premium to "Royal Mammoth," W. Stigall, Stamford, Lincoln county, Ky. 15

JACKS THREE YEARS OLD AND UNDER FOUR.

Second Premium to "Black Sampson," Bonta & Lawrence, Pleasureville, Ky..... 15

JACKS TWO YEARS OLD AND UNDER THREE.

First Premium to "Lincoln," J. M. Hill, Harristown, Macon county, Ill..... 25
Second Premium to "J. P. Hill," W. D. Bonta, Pleasureville, Ky..... 15

JACKS ONE YEAR OLD AND UNDER TWO.

First Premium to "Colonel Pass," G. M. Caldwell, Williamsville..... 25
Second Premium to "Oren," John McConnell, Rome..... 15

JENNETS THREE YEARS OLD AND OVER.

First Premium to "Jane," Wm. Shumate, Springfield..... 25
Second Premium to "Mary," W. T. Baker, Mt. Auburn..... 15

JENNET OVER ONE YEAR OLD AND UNDER TWO.

First Premium to "Nancy," John McConnell, Rome..... 25

PAIR OF MULES.

First Premium to "Topsey and Jennie," Thomas S. Adams, Mt. Sterling..... 20
Second Premium to Charles Bridges..... 10

SINGLE MULE OVER TWO YEARS OLD AND UNDER THREE.

First Premium to "Riley," Jonathan Patterson, Rushville..... 20

SINGLE MULE OVER ONE YEAR OLD AND UNDER TWO.

First Premium to "Jenny," W. T. Tackett..... 10

SUCKING MULES.

First Premium to "Kate," W. T. Tackett..... 10

Awarding Committee.—W. B. Foreman, Chairman, Nashville; David Shanafeldt, Salem; John G. White, Decatur; John Willbanks, Mt. Vernon; H. H. Mussey, Magnolia.

CLASS C—SHEEP.

A. B. McConnell, Springfield, *Superintendent.*

LOT 16—LONG WOOLED.

BUCK OVER TWO YEARS OLD.

First Premium to "Chief," P. G. Bauder, New Milford.....$15
Second Premium to E. F. Iles, Springfield..... 10

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BUCK OVER ONE AND UNDER TWO YEARS OLD.

First Premium to P. G. Bauder, New Milford.....$15
Second Premium to D. S. Allen, Harristown..... 10

BUCK LAMB UNDER ONE YEAR OLD.

First Premium to E. F. Iles, Springfield..... 15
Second Premium to D. S. Allen, Harristown..... 10

PEN OF THREE EWES OVER TWO YEARS OLD.

First Premium to P. G. Bauder, New Milford..... 15
Second Premium to D. S. Allen, Harristown..... 10

PEN OF THREE EWES OVER ONE AND UNDER TWO YEARS OLD.

First Premium to C. L. Pate, Catlin..... 15
Second Premium to P. G. Bauder, New Milford..... 10

PEN OF THREE EWE LAMBS UNDER ONE YEAR OLD.

First Premium to D. S. Allen, Harristown..... 15
Second Premium to P. G. Bauder, New Milford..... 10

LOT 17—MIDDLE WOOLED.

BUCK OVER TWO YEARS OLD.

First Premium to J. N. Brown, Berlin.....$15
Second Premium to E. F. Iles, Springfield..... 10

BUCK UNDER TWO YEARS OLD.

First Premium to J. N. Brown, Berlin..... 15
Second Premium to E. F. Iles, Springfield..... 10

BUCK LAMB UNDER ONE YEAR OLD.

First Premium to J. H. Pickrell, Harristown..... 15
Second Premium to C. H. Rosenstiel, Freeport..... 10

PEN OF EWES OVER TWO YEARS OLD.

First Premium to J. N. Brown, Berlin..... 15
Second Premium to J. H. Pickrell, Harristown..... 10

PEN OF EWES UNDER TWO YEARS OLD.

Premium to J. H. Pickrell, Harristown..... 15

PEN OF EWE LAMBS UNDER ONE YEAR OLD.

First Premium to C. H. Rosenstiel, Freeport..... 15
Second Premium to J. H. Pickrell, Harristown..... 10

Awarding Committee Lots 16 *and* 17.—John B. Hunter, Chairman, Greenville; E. D. Rose, Pittsfield; Andrew Oliver, Elmira.

LOT 18—FRENCH MERINOES.

BUCK OVER TWO YEARS OLD.

First Premium to "King Phillip," C. H. Rosenstiel, Freeport.....$15
Second Premium to W. D. Bonta, Pleasureville, Ky..... 10

BUCK UNDER TWO YEARS OLD.

First Premium to C. H. Rosenstiel, Freeport..... 15
Second Premium to P. G. Bauder, New Milford..... 10

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BUCK LAMB UNDER ONE YEAR OLD.

Premium to C. H. Rosenstiel, Freeport.....$15

PEN OF THREE EWES OVER TWO YEARS OLD.

First Premium to C. H. Rosenstiel, Freeport..... 15
Second Premium to P. G. Bauder, New Milford..... 10

PEN OF THREE EWES UNDER ONE YEAR OLD.

Premium to C. H. Rosenstiel, Freeport..... 15

PEN OF THREE EWE LAMBS.

Premium to C. H. Rosenstiel, Freeport..... 15

Awarding Committee.—Charles W. Murtfeldt, Chairman, Rockford; John Turnbull, Elmira; Wm. P. Thatcher, Decatur.

LOT 19—SPANISH MERINOES.

BUCK OVER TWO YEARS OLD.

First Premium to "Jed," C. H. Smith, Ney P. O.....$15
Second Premium to "Enterprise," Will Stewardson, Shelbyville..... 10

BUCK UNDER TWO YEARS OLD.

First Premium to "Woolly," Gorham & Gillett, Hadley..... 15
Second Premium to "Gold Drop," Booker & Bush, Shoreham, V.....10

BUCK LAMB UNDER ONE YEAR OLD.

First Premium to C. H. Smith, Ney P. O..... 15
Second Premium to "Young Enterprise," Will Stewardson, Shelbyville..... 10

PEN OF THREE EWES OVER TWO YEARS OLD.

First Premium to C. H. Smith, Ney P. O..... 15
Second Premium to C. H. Smith, Ney P. O..... 10

PEN OF THREE EWES UNDER TWO YEARS OLD.

First Premium to C. H. Smith, Ney P. O..... 15
Second Premium to John Foulk, Mendota..... 10

PEN OF THREE EWE LAMBS.

First Premium to C. H. Smith, Ney P. O..... 15
Second Premium to C. H. Smith, Ney P. O..... 10

Awarding Committee.—Charles Brackett, J. L. Mills, M. B. Bliss, H. Wells.

LOT 20—CROSSES OF PURE BREEDS.

BUCK OVER TWO YEARS OLD.

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PEN OF THREE EWES OVER TWO YEARS OLD.

First Premium to P. G. Bauder, New Milford, Spanish and Silesian.....$15
Second Premium to C. H. Rosenstiel, Freeport..... 10

PEN OF THREE EWES UNDER TWO YEARS OLD.

First Premium to P. S. Spencer, Danville, Spanish and Silesian..... 15
Second Premium to C. H. Rosenstiel, Freeport..... 10

PEN OF THREE EWE LAMBS.

First Premium to E. E. Gorham, Hadley, French and Spanish..... 15
Second Premium to P. G. Bauder, New Milford, Spanish and Silesian..... 10

Awarding Committee.—George E. Eisenmeyer, Mascoutah; David Shanefeldt, Salem; Moses B. Bliss, St. Charles.

LOT 21—FAT SHEEP.

THREE FAT SHEEP OVER TWO YEARS OLD.

Premium to E. F. Iles, Springfield.....$10

THREE FAT SHEEP UNDER TWO YEARS OLD.

Premium to James N. Brown, Berlin..... 10

Awarding Committee.—O. B. Nichols, S. B. Thomas, Elihu Stout, R. Peck.

LOT 22—SWEEPSTAKES.

ALL FINE WOOLED SHEEP.

Best lot of sheep of any age, not less than one buck and nine ewes:
First Premium to C. H. Smith, Ney P. O., Spanish Merinoes.....$20
Second Premium to P. S. Spencer, Danville..... 10

Awarding Committee.—Samuel P. Boardman, James M. Thomas, John R. Parsons.

LOT 23—SWEEPSTAKES.

MUTTON BREEDS FAT SHEEP.

Best lot of sheep of any age, not less than one buck and nine ewes:
First Premium to J. N. Brown, Berlin.....$20
Second Premium to D. S. Allen, Harristown..... 10

Awarding Committee.—O. B. Nichols, S. B. Thomas, Elihu Stout, R. Peck.

CLASS D—SWINE.

A. B. McConnell, Springfield, *Superintendent.*

LOT 24—BERKSHIRES.

BOAR OVER ONE YEAR OLD.

First Premium to Jesse Cloyd, Champaign City.....$10
Second Premium to Thomas J. Crowder, Springfield..... 5

BOAR UNDER ONE YEAR OLD.

First Premium to Jesse Cloyd, Champaign City..... 10
Second Premium to Thomas J. Crowder, Springfield..... 5

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SOW OVER ONE YEAR OLD.

First Premium to "Juno," T. J. Crowder, Springfield.....$10

SOW UNDER ONE YEAR OLD.

First Premium to "Gipsey Queen," T. J. Crowder, Springfield..... 10
Second Premium to Jesse Cloyd, Champaign City.... 5

SOW WITH LITTER OF PIGS.

First Premium to "Juno" and 11 pigs, Thomas J. Crowder, Springfield..... 15

LOT 25—CUMBERLAND, YORKSHIRE, CHESTER WHITE, WOBURN, IRISH AND MAGIE BREEDS.

BOAR OVER ONE YEAR OLD.

First Premium to Ralph & Ferguson, Champaign City.....$10
Second Premium to O. Wallace, Clayton..... 5

BOAR UNDER ONE YEAR OLD.

First Premium to Ralph & Ferguson, Champaign City..... 10
Second Premium to Henry Funk, Bloomington..... 5

SOW OVER ONE YEAR OLD.

First Premium to O. Wallace, Clayton..... 10

SOW UNDER ONE YEAR OLD.

First Premium to Henry Funk, Bloomington..... 10
Second Premium to Ralph & Ferguson, Champaign City..... 5

SOW WITH LITTER OF PIGS.

First Premium to Frank Searls, Hadley, Chester White..... 15

Awarding Committee.—Wm. B. Foreman, Nashville; J. T. Perrine, Carlyle; S. E. Stevenson, Salem.

LOT 26—SUFFOLKS, CHINA, ESSEX, AND OTHER SMALL DISTINCT BREEDS.

BOAR OVER ONE YEAR OLD.

First Premium to "Prince Albert," Suffolk, P. G. Bauder, New Milford.....$10
Second Premium to J. M. Gillett, Hadley..... 5

BOAR UNDER ONE YEAR OLD.

Premium to Charles Snoad, Joliet..... 10

SOW OVER ONE YEAR OLD.

Premium to "Lady Suffolk," P. G. Bauder, New Milford..... 10

SOW UNDER ONE YEAR OLD.

Premium to Charles Snoad, Joliet..... 10

LOT 27—CROSSES.

BOAR OVER ONE YEAR OLD.

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SOW OVER ONE YEAR OLD.

First Premium to E. P. Jones, Insane Asylum, Jacksonville, "Hospital Breed,"...$10
Second Premium to J. M. Gillett, Hadley..... 5

SOW UNDER ONE YEAR OLD.

First Premium to O. Wallace, Clayton, Poland and Magie..... 10
Second Premium to E. P. Jones, "Hospital Breed," Insane Asylum, Jacksonville. 5

SOW WITH LITTER OF PIGS UNDER FOUR MONTHS OLD.

First Premium to E. P. Jones, Insane Asylum, Jacksonville..... 15
Second Premium to J. M. Gillett, Hadley..... 10

Awarding Committee.—William Blackburn, Grand View; Joseph G. Wolder, John T. Perrine, Carlyle.

LOT 28—SWEEPSTAKES.

BOAR AND THREE SOWS.

First Premium to Frank Searls, Hadley.....$20
Second Premium to E. P. Jones, Insane Asylum, Jacksonville..... 10

BOAR OF ANY AGE.

Premium to Ralph & Ferguson, Champaign City 15

SOW OF ANY AGE.

Premium to E. P. Jones, Insane Asylum, Jacksonville, "Hospital Breed,"..... 15

Awarding Committee.—James Snyder, Morrison; O. B. Nichols, Carlyle.

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CLASS E—POULTRY.

A. B. McConnell, Springfield, *Superintendent.*

LOT 29.

SHOW OF NOT LESS THAN FIVE DISTINCT BREEDS OF CHICKENS, OWNED BY ONE EXHIBITOR.

First Premium to David Callahan, Springfield.....$8

SHOW OF POULTRY, OTHER THAN CHICKENS, BY ONE EXHIBITOR, NOT LESS THAN FIVE BREEDS.

First Premium to David Callahan, Springfield..... 8

PAIR OF CHICKENS FOR FARMER'S USE.

First Premium to F. B. Talt, Decatur..... 3
Second Premium to David Callahan, Springfield..... 2

SHOW OF PIGEONS.

First Premium to David Garver, Decatur..... 2

[Names of Awarding Committee not given by Chairman.]

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CLASS F—AGRICULTURAL IMPLEMENTS AND MECHANIC ARTS.

Wm. Kile, Paris; H. C. Jones, Decatur, *Superintendents.*

LOT 30.—PLOWS, SOWERS, ROLLERS AND CULTIVATORS.

Best two-horse Plow, for general purposes—John Dement, Dixon, Lee Co...Silver Medal.

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Best two-horse Plow for sod or turf—Deere & Co., Moline.....Silver Medal.

Best Gang Plow—J. F. & W. L. Black, Lancaster.....Silver Medal.

Best one-horse Plow—John Dement, Dixon.....Silver Medal.

Best one-horse Double or Treble Shovel Plow—Deere & Co., Moline.....Silver Medal.

Best Trench Plow—J. F. & W. L. Black, Lancaster.....Silver Medal.

Best two-horse Independent Cultivator—Furst & Bradley, Chicago.....Silver Medal.

[The Committee find so many excellent machines of this class that it is extremely difficult to make a distinction, with a few exceptions. All the two-horse cultivators showed great excellence in construction and did good work in the field.]

Best two-horse Cultivator with combination for seeding and planting—C. Denton, Pekin.....Silver Medal.

Best Grain Drill—McSherry, Kneisley & Co., Dayton, Ohio.....Silver Medal.

Best Broadcast Grain Sower—Galt, Tracy & Co , Sterling.....Silver Medal.

Best two-horse Corn Planter—Bergen & Sisson, Galesburg.....Silver Medal.

Awarding Committee.—C. L. Eaton, Homer; Jacob Rogers, Paris; Abram Brown, Dixon; James R. Taggart, Ridott; A. W. Martin, Knoxville.

LOT 31—THRESHING AND OTHER MACHINES.

Best Threshing Machine and Separator—J. I. Case & Co., Racine, Wis.....Silver Medal.

Best Eight Horse Power—J. I. Case & Co., Racine, Wis .....Silver Medal.

Best Two Horse Power—E. W. Skinner & Co., Madison, Wis.....Silver Medal.

Best One-Horse Power—Sanger & Co., Joliet.....Silver Medal.

Best Clover Huller and Separator—John E. Birdsell, South Bend, Ind.....Silver Medal.

Best Corn and Cob Mill—J. A. Carpenter, Beloit, Wis.....Silver Medal.

Best Cider Mill—F. C. Winslow, Freeport.....Silver Medal.

Best Horse Power Corn Sheller—Sanger & Co., (2 horse) Joliet.....Silver Medal.

Best Horse Hay Fork—T. G. & M. W. Palmer, Chicago.....Silver Medal.

Best Hay Pitching Machine—T. G. & M. W. Palmer, Chicago.....Silver Medal.

Best Straw and Hay Cutter—W. D. Schooley, Richmond, Ind..... Silver Medal.

Best Smut Machine—G. E. Throop, Chicago.....Silver Medal.

Largest and best display of Agricultural Implements—Emerson & Co., Rockford.....Silver Medal.

Awarding Committee.—Urial Mills, Salem; J. W. Fawkes, Decatur; W. Furman, Moline.

LOT 32—ENGINES AND MACHINERY.

Best and cheapest Windmill and Pump for farm purposes—W. N. Santee, Dixon.....Silver Medal.

Best Pump for Well—J. C. Montgomery, Springfield.....Silver Medal.

Best Pump for Cistern—J. R. Baker, St. Charles.....Silver Medal.

Best Portable Grist Mill—W. D. Nichols, Chicago.....Silver Medal.

Best Power Loom—George Hoover, Richmond, Ind.....Silver Medal.

Best one hundred common Brick—Robert Shelton, Yates City.....Agricultural Journal.

Best Mill for Grinding Sugar Cane—"Climax Adjustable," E. W. Skinner & Co., Madison, Wis.....Silver Medal.

Best Sugar Evaporator—Cook's Evaporator, C. D. Roberts, Jacksonville...Silver Medal.

Best Wood Sawing Machine—Burnham, Baker & Wakely, Battle Creek, Michigan.....Silver Medal.

Awarding Committee.—J. W. Fawkes, Decatur; R. Greely, Maroa; J. H. Bigelow, Decatur.

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LOT 33—STOVES, CASTINGS AND WORKED METALS.

Best Cooking Stove for Wood—Charles F. Whorf, St. Louis, Mo...Agricultural Journal.
Best Cooking Stove for Coal—Charles F. Whorf, St. Louis.....Agricultural Journal.
Best Parlor Stove—F. K. Alexander, Decatur.....Agricultural Journal.
Best Weather Strip for Doors—Clay & Gray, Hudson, Wis.....Agricultural Journal.
Best Window Spring—John Starr, Decatur.....Agricultural Journal.
Best Hay and Cattle Scales—Gouldman, Morris & Co., Indianapolis, Ind....Silver Medal.
Best Portable Scale with Wheels—John Howe, Brandon, Vt..... .....Silver Medal.
Best Union Scales—John Howe, Brandon, Vt.....Silver Medal.
Best Grocers' Scales—John Howe, Brandon, Vt.....Silver Medal.
Best Target Rifle—J. G. Ransier, St. Louis, Mo.....Silver Medal.

LOT 34—VEHICLES, FURNITURE AND HOUSEHOLD IMPLEMENTS.

Best Top Buggy—T. L. Payne, Bridgeport, Ct.....Silver Medal.
Best Two-Horse Wagon—J. S. Owen, Evansville, Wis.....Silver Medal.
Best Churn—Charles R. Gorgas, Dixon.....Agricultural Journal.
Best Clothes Horse—John Danner, Canton, Ohio.....Agricultural Journal.
Best Washing and Wringing Machine—Eben Blakeman, Charleston.....Silver Medal.

LOT 35—MANUFACTURES OF VARIOUS KINDS.

Best display of Fancy Soaps—J. J. D. Rush & Co., Chicago.....Silver Medal.
Best Carriage Harness—John Harpham, Sterling.....Silver Medal.
Best Single Buggy Harness—John Harpham, Sterling.....Silver Medal.

Awarding Committee Lots 33, 34 *and* 35.—E. M. Henkle, Decatur; L. B. Erwin, Morrison; James Sykes, Beverly.

CLASS G—FARM PRODUCTS.

H. S. Oxburn, Pinckneyville, *Superintendent.*

LOT 36—GRAIN AND VEGETABLES.

Best bushel White Winter Wheat:
First Premium to W. D. Trick, Jonesboro.....$10
Second Premium to Stillman Barber, Millmine..... ... 5

Best bushel Red Winter Wheat:
First Premium to R. K. Lansden, Wilson..... 10

Best bushel Spring Wheat:
First Premium to E. P. Jones, Insane Hospital, Jacksonville..... 10
Second Premium to J. R. Moon, Decatur..... 5

Best bushel Rye:
First Premium to Stillman Barber, Millmine..... 5
Second Premium to M. L. Dunlap, Champaign..... 3

Best bushel Oats:
First Premium to D. S. Pardee, Rockford..... 5
Second Premium to Frank Searles, Hadley..... 3

Best bushel Spring Barley:
First Premium to James Hart, Harristown..... 5

Best bushel, in ear, White Indian Corn:
First Premium to J. R. Moon, Decatur..... 10
Second Premium to J. Jefferson, Decatur..... 5

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Best bushel, in ear, Yellow Indian Corn:

First Premium to Wm. Saunders, Harristown.....$10
Second Premium to J. Spangler, Decatur..... 5

Best Corn on stalk, five or more stalks:

First Premium to W. Sanders, Harristown..... 2
Second Premium to A. A. Hooker, Decatur..... 1

Best bushel Timothy Seed:

Premium to Stillman Barber, Millmine..... 5

Best bushel Clover Seed:

Premium to C. H. Rosenstiel, Freeport..... 10

Best bushel Early Irish Potatoes:

First Premium to M. Dunlap, Champaign, Early York..... 10
Second Premium to Dr. H. Schroeder, Bloomington..... 5

Best bushel Late Irish Potatoes:

First Premium to B. W. Davis, Belleville..... 2
Second Premium to Dr. H. Schroeder, Bloomington..... 1

Best bushel Sweet Potatoes:

Premium to J. A. Carpenter, South Pass..... 3

Best bushel Onions:

Premium to S. Wilber, Momence..... 5

Best bushel Beets:

Premium to Nancy Warren, Decatur..... 2

Best twelve stalks Celery:

Premium to Insane Hospital Jacksonville..... 3

Best six heads Cabbage:

First Premium to Susannah Tait, Decatur..... 3
Second Premium to Dr. H. Schroeder, Bloomington..... 1

Best half bushel Tomatoes:

Premium to J. F. Schoch, Decatur..... 3

Best peck Lima Beans:

Premium to G. W. Pitt, Decatur..... 2

Best and greatest variety Garden Peas:

Premium to S. Wilber, Momence..... 1

Best lot Pumpkins:

Premium to Nathan Herrenden, Decatur..... 1

Best and greatest variety of Vegetables, by one person:

First Premium to E. P. Jones, Insane Asylum, Jacksonville..... 10
Second Premium to S. Wilber, Momence..... 5

Best and greatest variety of Garden Seeds raised in Illinois:

Premium to S. Wilber, Momence..... 5

Best ten pounds Tobacco:

Premium to G. W. Pitt, Decatur..... 5

Awarding Committee.—J. B. Folks, Fairmount; Peter Roberts, Franklin; Philo

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Best ten pounds fresh Butter, in roll:

First Premium to J. F. Schoch, Decatur $5
Second Premium to Miss Susan Ritcher, Decatur 3

Best Cheese, one year old or over:

First Premium to C. H. Rosenstiel, Freeport 20

Best Cheese, under one year old:

First Premium to Edward Delland, Tacusah 20
Second Premium to C. H. Rosenstiel, Freeport 10

Best new Cheese:

First Premium to Calvin Burns, Bloomington 10

Best ten pounds of Honey:

First Premium to J. L. Wolcott, Bloomington 5
Second Premium to O. Cowgill, Rosemond 3

Best two loaves of Bread, hop yeast:

First Premium to Mrs. John Imboden, Decatur 3
Second Premium to M. A. Baker, Milmine 2

Best two loaves Bread, milk raising:

First Premium to M. A. Barber, Milmine 3
Second Premium to Miss S. Fithian, Milmine 2

Best two loaves Bread from unbolted flour:

First Premium to Insane Hospital, Jacksonville 3
Second Premium to Mrs. A. N. McDonald, Jacksonville 2

Best two loaves Rye Bread:

First Premium to Mrs. A. N. McDonald, Jacksonville 3

Best two loaves Corn Bread:

First Premium to Mrs. A. N. McDonald, Jacksonville 3

Best Sponge Cake:

First Premium to Mrs. A. N. McDonald, Jacksonville 2
Second Premium to Mrs. H. M. Edwards, Watson 1

Best Pound Cake:

First Premium to M. A. Barber, Milmine 2
Second Premium to Miss S. Fithian, Milmine 1

Best Jelly Cake:

First Premium to Mrs. A. N. McDonald, Jacksonville 2
Second Premium to Miss Lucy R. Green, Harristown 1

Best Gold Cake:

First Premium to Mrs. A. N. McDonald, Jacksonville 2
Second Premium to Mrs. K. H. Roby, Decatur 1

Best Silver Cake:

First Premium to Mrs. A. N. McDonald, Jacksonville 2
Second Premfum to Mrs. K. H. Roby, Decatur 1

Best Nut Cake:

First Premium Mrs. A. N. McDonald, Jacksonville 2

Best Ginger Cake:

First Premium to Mrs. A. N. McDonald, Jacksonville 2

Best Sour Pickled Cucumbers:

First Premium to Mrs. H. B. Halstead, Tuscola 1

Best Tomato Catsup:

First Premium to Mrs. L. L. [illegible] Decatur 1

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CLASS H—HORTICULTURAL AND FLORAL DEPARTMENT.

WM. S. WAIT, Greenville, and CHARLES H. ROSENSTIEL, Freeport, *Superintendents.*

LOT 38—FRUIT TREES AND FRUIT.

Best display of Fruit and Ornamental Trees:
First Premium to F. K. Phœnix, Bloomington.....$10

Best display of Ornamental Shrubs:
First Premium to F. K. Phœnix, Bloomington..... 10

Best display of Hardy Evergreen Trees:
First Premium to F. K. Phœnix, Bloomington..... 10

Best collection of Apples, 25 varieties:
First Premium to W. & A. J. Cutter, Beverly..... 10
Second Premium to Martin Allen, Mendota..... 5

Best 15 varieties of Apples, of Southern Illinois:
First Premium to Seth C. Jones, Carbondale..... 10
Second Premium to Stillman Barber, Milmine..... 5

Best 15 varieties of Apples of Northern Illinois:
First Premium to W. H. Hausen, Franklin Grove..... 10
Second Premium to Charles H. Rosenstiel, Freeport..... 5

Best and greatest variety Siberian Crab:
First Premium to C. W. Murtfeldt, Rockford..... 1

Best collection of Apples, by amateurs:
First Premium to W. H. Hausen, Franklin Grove..... 6
Second Premium to W. H. Jones, Quincy..... 3

Best collection of Pears, by amateurs:
First Premium to W. H. Hausen, Franklin Grove..... 5
Second Premium to Stillman Barber, Milmine..... 3

Best collection of Pears, ten varieties, the produce of this State:
First Premium to Wm. Yates, Springfield..... 10
Second Premium to Stillman Barber, Milmine..... 5

Best collection of Autumn Pears, six varieties, the product of this State:
First Premium to S. W. Arnold, Cortland..... 6
Second Premium to Wm. Yates, Springfield..... 3

Best collection of Winter Pears, three varieties, the product of this State:
First Premium to C. H. Rosenstiel, Freeport..... 3

Best collection of Plums:
First Premium to Martin Allen, Mendota..... 3

Best collection Autumnal Raspberries:
First Premium to H. Schroeder, Bloomington..... 2

Best and greatest variety of Native Grapes:
First Premium to H. Schroeder, Bloomington..... 3

Best and greatest variety of Foreign Grapes:
First Premium to H. Chaffee, Tolono..... 3

Best early Grapes, three varieties, six bunches each:
First Premium to W. & A. J. Cutter, Beverly..... 3
Second Premium to Charles H. Rosenstiel, Freeport..... 4

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Awarding Committee.—K. K. Jones, Quincy; L. Woodward, Marengo; J. A. Carpenter, Cobden; B. G. Roots, Tamaroa.

LOT 39—CANNED AND PRESERVED FRUITS.

Best preserved Peaches in sugar:
First Premium to Mrs. A. N. McDonald, Jacksonville.....$2

Best preserved Plums in sugar:
First Premium to W. Anderson, Decatur..... 2
Second Premium to W. Anderson, Decatur..... 1

Best preserved Siberian Crab Apples in sugar:
First Premium to Mrs. C. W. Murtfeldt, Rockford..... 2

Best preserved Pears in sugar:
First Premium to Mrs. C. W. Murtfeldt, Rockford..... 2

Best Crab Apple Jelly:
First Premium to Mrs. A. N. McDonald, Jacksonville..... 2

Best Plum Jelly:
First Premium to Mrs. A. N. McDonald, Jacksonville..... 2

Best Apple Jelly:
First Premium to Mrs. A. N. McDonald, Jacksonville..... 2

Best Currant Jelly:
First Premium to Mrs. A. N. McDonald, Jacksonville..... 2

Best Apple Butter:
First Premium to Elizabeth Miller, Decatur..... 2
Second Premium to Susanna Tait, Decatur..... 1

Best Peach Butter:
First Premium to Mrs. John R. Woods, Upper Alton..... 2

Awarding Committee.—W. O. Jones, Decatur; Mrs. G. M. Dale, Edwardsville; Mrs. E. D. Mann, Bloomington; Mrs. W. H. Ennis, Decatur.

LOT 40—FLOWERS AND PLANTS.

Best six Fuschias in bloom:
First Premium to F. K. Phœnix, Bloomington.....$5

Best and greatest variety Verbenas:
First Premium to F. K. Phœnix, Bloomington..... 2

Best and greatest variety of Astors:
First Premium to Mrs. A. M. Pitt, Decatur..... 1

LOT 41—FLORAL DESIGNS AND BOUQUETS.

Best Rural Design:
First Premium to J. B. Reeves, Moulton.....$10
Second Premium to Benjamin F. Shields, Springfield..... 5

Best Floral Arch:
First Premium to Mrs. J. B. Reeves, Moulton..... 5

Best and greatest variety named Flowers:
First Premium to F. K. Phœnix, Bloomington..... 5
Second Premium to Mrs. Mahlin Hayworth, Decatur..... 3

Best and most tastefully arranged Cut Flowers:
First Premium to S. E. Hills, Odin..... 2

Best and most tastefully arranged Flat Bouquets:
First Premium to F. K. Phœnix, Bloomington..... 3

Best and most tastefully arranged basket of Cut Flowers:
First Premium to F. K. Phœnix, Bloomington..... 2

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Best and most tastefully arranged pair Round Bouquets:
First Premium to F. K. Phœnix, Bloomington.....$2

[Names of Awarding Committee to Lots 40 and 41 not returned by Chairman.]

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CLASS I—FINE ARTS.

R. H. Holden, Bloomington, *Superintendent.*

LOT 42—MUSICAL INSTRUMENTS.

Best Square Piano:
Premium to G. W. Chatterton, Springfield.....Silver Medal.

Best Melodeon:
Premium to Root & Cady, Chicago.....Silver Medal.

Best Artificial Leg:
Premium to P. J. Bradley, New York city.....Silver Medal.

Awarding Committee.—Mrs. E. W. Marshall, Harrisville, New Hampshire; Miss Josie E. Day, Peoria; J. C. Ayres, Dixon.

LOT 43—SCULPTURE, PAINTING, DRAWING.

Best Specimen Sculpture:
Premium to D. Strohn & Co., Decatur.....Silver Medal.

Fancy Painting in Oil:
Premium to Mrs. E. Stevens, Mt. Morris.....Silver Medal.

Best Fruit Painting in Oil:
Premium to Mrs. J. S. D. Kirby, Jacksonville.....Silver Medal.

Best collection of Paintings in Oil:
Premium to G. H. Adams, Hillsboro.....Silver Medal.

Best Wood Cut:
Premium to Thomas Bruton, (Bond & Chandler, Engravers,) Chicago....Silver Medal.

Best specimen Flower Painting in Water Colors:
Premium to Mrs. O. Z. Green, Harristown.....Silver Medal.

Best Specimen Bird Painting in Water Colors:
Premium to Mrs. J. S. D. Kirby, Jacksonville.....Silver Medal.

Best Photographs:
Premium to E. A. Barnwell, Decatur.....Silver Medal.

Awarding Committee.—A. Bryant, Princeton; G. W. Minier, Tazewell county; R. Stremple, Bloomington.

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CLASS K—TEXTILE FABRICS, SEWING AND KNITTING MACHINES.

A. J. Matteson, Prophetstown, *Superintendent.*

LOT 45—HOUSEHOLD FABRICS.

Best 10 yards All-Wool Flannel:
First Premium to Mrs. E. Bohrer, Decatur.....Silver Medal and $10
Second Premium to Mrs. E. J. Hooker, Decatur..... 5

Best Display of Yarn:
First Premium to Elizabeth Maffit, Decatur.....Silver Medal and $5
Second Premium to Mrs. E. J. Hooker, Decatur..... 3

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Best pair Men's Socks:
Premium to Mrs. E. M. Bohrer, Decatur..... $5

Best Pair Ladies' Stockings:
First Premium to Mrs. J. B. Reeves, Moulton..... 5
Second Premium to Mrs. H. B. Halstead, Tuscola..... 3

Best Coverlet:
First Premium to Thomas Pharis, Decatur.....Silver Medal and $5
Second Premium to Mrs. Sarah Adams, Decatur..... 3

Best 10 yards Jeans:
Premium to Mrs. E. M. Bohrer, Decatur.....Silver Medal and $10

Best Rag Carpet:
Premium to Mrs. Margaret Shuph, Decatur.....Silver Medal and $5

Best display of Linen Goods:
First Premium to Mrs. E. H. Stroh, Decatur..... 10
Second Premium to Mrs. Elizabeth Maffit, Decatur..... 5

Best display Ladies and Gents' Boots and Shoes:
Premium to G. F. Wessels, Decatur..... 5

Awarding Committee—J. T. Little, Dixon; Mrs. L. H. Robinson, Morrison; Mrs. Jno. R. Woods, Upper Alton.

LOT 46—NEEDLE, SHELL AND WAX WORK.

Best Plain Knitting:
First Premium to Mrs. L. L. Hayworth, Decatur..... $5
Second Premium to Miss Mary E. Myers, Decatur..... 3

Best Plain Sewing:
First Premium to Hester A. Gillam, Exeter..... 5
Second Premium to Mrs. John R. Woods, Alton..... 3

Best Plain Sewing by child under 12 years old:
First Premium to Miss Mary E. Myers, Decatur..... 5
Second Premium to Miss Alice Adair, Tallula..... 3

Best Crochet or Fancy Knitting Work:
First Premium to Mrs. E. H. Stroh, Decatur..... 5
Second Premium to Miss Mary E. Myers, 9 years old..... 3
Third Premium to Mrs. C. C. Burroughs, Decatur..... 2

Best and most tastefully executed Patch Work Quilt or Coverlet:
First Premium to Mrs. S. W. True, Mattoon..... 5
Second Premium to Mrs. Barbara Sidenbender, Morris..... 3
Third Premium to Mrs. Hettie Irvine, Yates City..... 2

Best Patch Work Quilt by child under 12 years old:
First Premium to Mary L. Halstead, Tuscola..... 5
Second Premium to Mrs. H. N. Edwards, for child, Watson..... 3

Best Lace Work or Hemstitching:
First Premium to Mrs. N. S. McCord, Paris..... 5
Second Premium to Mrs. E. H. Stroh, Decatur..... 3
Third Premium to Mary E. Myers, under 9 years old..... 2

Best specimen Ladies' Embroidered Slippers:
Premium to Mrs. Frances E. Sweat, Peoria..... 2

Best Worsted Embroidery:
First Premium to Miss C. C. Myers, Springfield..... 5
Second Premium to Mrs. Susan Burrows, Decatur..... 3
Third Premium to Mrs. Eliza W. Marshall, Decatur..... 2

Raised Worsted Embroidery:
Premium to Mrs. Eliza W. Marshall, Decatur..... 2

Best Needle Work or Floss Embroidery:
First Premium to Mrs. L. R. Morse, Decatur..... 5
Second Premium to Mrs. K. H. Roby, Decatur..... 3
Third Premium to Alice W. McClure, Bloomington..... 2

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Best Silk Embroidery:

First Premium to Mrs. W. J. Brown, Decatur..... $5
Second Premium to James Muir, Chicago..... 3
Third Premium to James Muir, Chicago..... 2

Best display in Wax Work, Feathers, Hair, Crape, Spice, etc.:

[The entries on the book by the Awarding Committee are much *mixed*. The following is a copy.—*Cor. Secretary.*]

Second Premium to J. W. Crowell, Decatur, feather work..... 3
First Premium to A. E. James, (blind,) hair brush..... 5
First Premium to Mrs. E. H. Stroh, Decatur, crape..... 5
First Premium to George S. Lyon, Decatur, hair work..... 5
Second Premium to Miss Hill, Harristown, hair work..... 3
Second Premium to Mrs. E. Stevens, Mount Morris, wax work..... 3
Third Premium to Miss Mary L. Smith, Decatur, wax work..... 2

Leather Work:

First Premium to Mattie L. Wells, Decatur..... 5
Second Premium to J. A. Buckingham, Decatur..... 3

Bead Work:

First Premium to Miss C. C. Myers, Springfield..... 5
Second Premium to A. H. Boze, Decatur..... 3
Third Premium to Nancy Warren, Decatur..... 2

Shell Work:

First Premium to Mrs. E. E. Myers, Springfield..... 5
Second Premium to Mrs. J. R. Woods, Upper Alton..... 3
Third Premium to H. E. Sallie, Decatur..... 2

Best Agricultural Wreath:

First Premium to Mrs. C. E. Lawson, Jacksonville..... 5
Second Premium to Mrs. M. E. Washburn, Decatur..... 3

Awarding Committee.—John R. Woods, Chairman, Upper Alton; Mrs. R. A. Swanwick, Grand Cote, P. O.; Mrs. J. E. Duffin, Morrison; Mrs. L. R. Cavender, Eureka; Mrs. J. R. Woods, Upper Alton.

CLASS L—NATURAL HISTORY.

R. H. Holder, Bloomington, *Superintendent.*

LOT 47—BOTANY, GEOLOGY AND ZOOLOGY.

Best collection Illinois Botany:

First Premium to Illinois Wesleyan University, Bloomington..... $40
Second Premium to Illinois Natural History Society, Bloomington..... 20

Best collection of Minerals:

First Premium to Illinois Wesleyan University, Bloomington..... 20
Second Premium to Illinois Natural History Society, Bloomington..... 10

Best collection of Fossils:

First Premium to Illinois Natural History Society, Bloomington..... 40
Second Premium to Illinois Wesleyan University, Bloomington..... 20

Best collection of Birds:

First Premium to R. H. Holder, Bloomington..... 40
Second Premium to Illinois Wesleyan University, Bloomington..... 20

Best collection Conchology of Illinois:

First Premium to Illinois Natural History Society, Bloomington..... 20
Second Premium to Illinois Wesleyan University, Bloomington..... 10

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CLASS M.

URIAL MILLS, Salem, *Superintendent.*

LOT 49—PLOWING AND SPADING MATCHES.

Plowing Match for Men:
First Premium to Wm. McCord, Paris.....$15
Second Premium to E. Mills, Salem..... 10

Plowing Match for boys under 16 years old:
First Premium to E. Mills, Salem..... 15
Second Premium to Leonard Kile, Paris..... 10

Best Subsoil Plowing:
Premium to J. F. & W. L. Black, Lancaster..... 10

Best Trench Plowing:
Premium to J. F. & W. L. Black, Lancaster..... 10

Awarding Committee.—A. Kinyon, Lee county; Ira P. Pratt, Tazewell county; J. F. Black, Cass county.

MISCELLANEOUS.

CLASS F—LOT 30.

Broadcast Seed Sower:
McSherry, Kneisley & Co., Dayton, Ohio.....Highly commended,

Combined Grain Drill and Grass Seed Sower:
McSherry, Kneisley & Co., Dayton, Ohio.....Highly commended.

Patent Plow Holder and Governor:
Valentine Felker, Decatur, Ill.....Highly commended.

Sulky Plow:
Charles Foster, Rockford, Ill.....Highly commended.

One-Horse Grain Drill for drilling wheat in standing corn:
L. L. Lawrence, Dublin, Ind.....Highest commendation.

LOT 31.

Hominy Mill:
John Donaldson, Rockford, Ill.....Highly commended.

Machine for Loading and Unloading Shock Corn:
James Mason, Polo, Ill.....Highly commended.

Frost's Patent Hay Loader:
Vroman Becker, Chicago, Illinois.....Highly commended.

Grain Separator:
L. A. Simons, Mount Morris, Ill.....Highly commended.

Ax Handles:
D. Crone, Decatur, Ill.....Highly commended.

Curved Bar Cylinder:
Vroman Becker, Chicago.....Highly commended.

Grain Register:
J. I. Case & Co., Racine, Wis.....Highly commended.

LOT 32.

Machine for Shrinking and Upsetting Tire:
Ferris & Bacon, Litchfield, Ill.....Highest commendation.

Centrifugal Force Pump:
Huntington & Alden, Chicago, Ill.....Highly commended.

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Power Wind Mill:
L. Bartholemew, Centralia, Ill .....Highly commended.

Cane Stripper:
E. Hayworth, Ridge Farm, Ill..... .....Highly commended.

Steam Governor:
A. White, Geneseo, Kane county, Ill..... .....Highly commended.

Ginning, Carding and Spinning Machine for Cotton:
James Pearce, Cincinnati, Ohio.....Highly commended.

LOTS 33, 34 AND 35.

Sample and Model Kitchen Furniture:
J. S. Cram, Boston, Mass .....Highly commended.

Work Bench:
J. S. Cram, Boston, Mass ... .Highly commended.

Book Bee Hive:
W. A. Flanders, Shelby, Ohio.....Highly commended.

Railroad Bulletin Boards:
R. T. Brown, Indianapolis, Ind., for Atlantic and G. W. R. R...Highest commendation.

Fine Printed Lettering:
R. T. Brown, Indianapolis, Ind., for Atlantic and G. W. R. R.....Highly commended.

Greatest variety of Railroad Advertising:
R. T. Brown, Indianapolis, Ind., for Atlantic and G. W. R. R.....Highly commended.

Spiral Spring Bed Bottom:
A. Gorton, Bloomington, Ill.... .....Highly commended.

Page's Bee Hive:
J. G. Page, Rockford, Ill.....Highly commended.

Folding and Extension Ladder:
J. G. Page, Rockford, Ill.....Highly commended.

Oriental Hygro Barometer:
F. P. Knowles, Chicago.....Highly commended.

Patent Wagon Hub:
J. C. Wicker, Chicago.....Highly commended.

Rope Halter:
George Ricker, Indianapolis, Ind.....Highly commended.

CLASS H—LOT 38.

Blackberries in Liquor:
David Garver, Decatur, Ill.....Highly commended.

Fig Tree:
Joseph King, Decatur, Ill.....Highly commended.

Capps' Mammoth Pippins:
E. S. Capps, Mt. Pulaski, Ill.....Highly commended.

LOTS 40 AND 41.

Ornamental Egg Plant:
Elizabeth Maffit, Decatur, Ill.....Highest commendation.

Sample Egg Plant:
Miss Susanna Tait, Decatur, Ill .....Highly commended.

Best Natural Orange Plant:
Mrs. C. K. Morgan, Decatur, Ill.....Highest commendation.

Scotch Ivy:
J. N. Fuller, Decatur, Ill..... .....Highly commended.

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CLASS I—LOT 43.

Specimens of Marbling and Graining, painted on paper:
Thomas Hart, Springfield, Ill.....Highly commended.

Card Writing:
J. W. McClure, Bloomington, Ill.....Highly commended.

Penmanship:
J. W. McClure, Bloomington, Ill.....Highly commended.

Pressed Flowers:
Miss E. Hill, Harristown, Ill.....Highly commended.

Three specimens Penmanship:
F. L. Matthews, Carlinville, Ill.....Highly commended.

Bootman's Piano-tuning Scale:
D. A. Chappell, Marengo, Ill.....Highly commended.

Water Color Paintings:
Mrs. E. Stevens, Mount Morris, Ill.....Highly commended.

Artificial Blackberries:
Mrs. S. A. Kitch, Shelbyville, Ill.....Highly commended.

CLASS K—LOT 45.

Child's Balmoral Hose:
Mrs. M. M. Gillespie, Decatur, Ill.....Highest commendation.

Child's White Ribbed Hose:
Mrs. M. M. Gillespie, Decatur, Ill.....Highly commended.

Child's Red Ribbed Hose:
Mrs. M. M. Gillespie, Decatur, Ills.....Highest commendation.

Embroidered Counterpane, made by girl 10 years of age:
Mrs. Wm. A. Mills, Dawson, Ill.....Highest commendation.

Traveling Blanket:
Mrs. Alice McClure, Bloomington, Ill.....Highest commendation.

Worsted Worked Rug:
Anna E. Fielding, Decatur, Ills.....Highest commendation.

Sample Raw Cotton:
W. W. Wilkins, Sparta, Ill.....Highly commended.

Specimen of Spinning Wool, carded by hand:
Mrs. H. B. Halstead, Tuscola, Ill.....Highly commended.

LOT 46.

Fancy Nut Frame:
Mrs. Kate Post, Decatur, Ill.....Highly commended.

Wreath of Artificial Flowers:
William Anderson, Decatur.....Highly commended.

Gold Embroidered Bouquet:
Miss C. C. Myers, Springfield, Ill.....Highest commendation.

Fancy Knit Suspenders:
Mrs. E. H. Stroh, Decatur, Ill.....Highly commended.

Cloth Shoes:
Mrs. E. H. Stroh, Decatur, Ill.....Highly commended.

White Knit Quilt:
Mrs. Henry Bishop, Decatur, Ills.....Highly commended.

Fancy Card Basket:
Mrs. John R. Woods, Upper Alton, Ill.....Highly commended.

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White Knit Quilt, made by mother of applicant, 78 years of age:
Mrs. M. Dunn, Upper Alton, Ill.....Highest commendation, and prem. recommended.

Silk Embroidered Banner:
Mrs. John R. Woods, Upper Alton, Ill.....Highest commendation.

Sample of Darning, by lady over 70 years of age:
Mrs. P. P. Enos, Springfield, Ill..... .....Highest commendation.

Specimen of Stitch Work:
Mrs. J. T. Taylor, Decatur, Ill.....Highly commended.

Silk Patch Work Quilt:
Mrs. Clarinda E. Mead, Dixon, Ill.....Highest commendation.

Crochet Insertion:
N. A. Rankin, Monmouth, Ill..... .....Highest commendation.

Piece of Quilting done on machine:
Grover & Baker. Very elaborate pattern, and work perfect....Highest commendation.

Piece of Fancy Stitching done on a machine:
Grover & Baker. Beautifully executed..... .....Highest commendation.

Plain Stitching done on a machine:
Grover & Baker.....Highest commendation.

Silk Embroidery done on a machine:
Grover & Baker..... .....Highest commendation.

Worsted Embroidery done on a machine:
Grover & Baker.....Highest commendation.

Worsted Quilt, by girl 7 years old:
Miss Katy Anderson, Orleans, Morgan county, Ill.....Highest commendation.

Specimen of Raw Silk—most beautiful specimen:
August Pagan, Highland, Madison co., Ill..Highest commendation, and premium of $3.

Work Box:
Inez N. Gass.....Highly commended.

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WINTER MEETING OF EXECUTIVE BOARD.

JANUARY, 1865.

PREMIUMS AWARDED.

Essay on "American Agricultural Colleges," by Richard Edwards, President of the Normal University, Bloomington, Illinois.
Special complimentary premium awarded to him.

Best Essay on "the Education of Farmers' Daughters:"
First Premium to Mrs. John R. Woods, Upper Alton.. ..... $20
Complimentary Premium to Miss M. E. Murtfeldt, Rockford..... 10

Market Gardens:
H. Schroeder, Bloomington..... 10

Apple Orchards:
Lucius C. Francis, Sangamon county..... 10

Best Bottle of Vinegar:
Mrs. John R. Woods, Upper Alton..... 1

Best three Bottles of Cider:
Thomas Bradbury, Griggsville, Pike county..... 3

Best Peaches in cans:
Mrs. John R. Woods, Upper Alton..... 3

Best Quinces in Cans:
Mrs. John R. Woods, Upper Alton..... 2

Best fresh Gooseberries in Cans:
Mrs. John R. Woods, Upper Alton..... 2

Best fresh Raspberries in Cans:
H. Schroeder, Bloomington..... 2

Best Fresh Strawberries in Cans:
H. Schroeder, Bloomington..... 2

Best Apple Butter:
Mrs. John R. Woods, Upper Alton..... 2

Best Peach Butter:
Mrs. John R. Woods, Upper Alton..... 2

Best six varieties of Winter Apples:
First Premium to Thomas Bradbury, Griggsville, Pike county..... 10
Second Premium to Lucius C. Francis, Sangamon county..... 5

Best gallon Chinese Cane Sirup, made without clarifying or refining:
Thomas Bradbury, Griggsville, Pike county..... 10

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Best three Bottles "Norton's Virginia Seedling" Wine:
H. Schroeder, Bloomington.....$10

Best three Bottles Clinton Wine:
H. Schroeder, Bloomington..... 10

Best Strawberry Wine:
Thomas Bradbury, Griggsville, Pike county..... 2

Best Cherry Wine:
Thomas Bradbury, Griggsville, Pike county..... 2

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REPORTS OF COUNTY SOCIETIES.

ADAMS COUNTY.

REPORT FOR 1862–64.

There has been a material increase of agricultural products the past four years over any former period of the same length. This has been accomplished (in the absence of our brave boys in the army) by a largely increased use of the best agricultural machinery, aided by a more general diffusion of scientific agricultural knowledge.

The two past seasons were very dry; but, I think, from all I can learn, that increased productions of corn and wheat have been raised over the four years preceding 1861.

Previous to the rebellion no tobacco was raised in this county, except for domestic use. During the past four years its production has been steadily increasing. It has proved a paying crop. The establishment of three large tobacco factories in the city of Quincy has drawn the attention of farmers to this crop, and the production will steadily increase. Thus far no large fields of tobacco have been planted.

Flax, hemp and cotton not grown.

The production of wool is very small, owing to the good-for-nothing dogs. These curs and their owners have caused more damage to the farmers of this county than all the dogs that ever barked were worth. The whole county is admirably adapted to sheep growing, and, for two years past, the number of sheep in the county has been more than doubled.

The Chinese and African sugar canes have not been grown upon a large scale; but nearly every farmer has raised from half to five acres. A near neighbor of mine, Mr. A. Kraber, and his two sons, have a neat molasses house, with an engine to run the crushing mill.

Sugar beets are not grown, except for stock, and not largely for that.

Fruit growing has attracted great attention, and, during the past two years, a great number of orchards have been planted, principally apple.

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The grape is perfectly at home here, and is being very generally planted by farmers for family use. Of vineyards, J. H. Stewart, Esq., has five thousand Delaware, one thousand Catawba, five hundred Concord, and a liberal supply of all other known sorts. Rev. Wm. Stewart and Geo. Hymer have as many more. A. J. Cutter also has a large number of bearing vines, which he has added to every year. In my own vineyard there is one thousand bearing vines, and this spring I shall plant two thousand more, principally Delaware, and shall add that number annually. Delaware, Catawba and Clinton are the grapes that do best here, both for wine and table use. There is money in all three. The Concord is a great bearer and good for those that like it, but to my taste it is a poor thing. I advise every body to plant it, because it bears "kicks and cuffs" so well, but always charge them to also plant Delaware and Catawba, without fail, "every time."

There has been no noise made about it, but surely and quietly old Adams is advancing to the position of the largest and best producer of fruits of any county in the State.

Wheat here is mixed, some fields good, others "gone up," others fair. That drilled and put in right is generally good. Fruit all safe.

The County Agricultural Society has not been in existence for three years.

K. K. JONES.

BOONE COUNTY.

REPORT FOR 1861–64.

The officers of the Boone County Agricultural Society are as follows, viz:

President—J. T. Tritbeck.
Vice-President—J. D. Tripp.
Secretary—A. E. Jenner.
Treasurer—W. P. Cornell.

New officers will be chosen on the 3d of June, when arrangements will be made for the Fair of 1865.

There has been a marked change in the agriculture of Boone

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CHRISTIAN COUNTY.

Christian county is situated in about the center of the State—its western boundary within about twelve miles of Springfield, the capital thereof. Population about 12,000. It contains about 414,720 acres of land, mostly prairie, with undulating surface, but interspersed with groves of timber. The North Fork of the Sangamon river, (heavily timbered,) is its northern boundary—the South Fork of the Sangamon, Flat Branch, and Bear Creek, having their several sources in the north-east, south-east and southern parts of the county, with several other smaller creeks, forming a junction near the center of the county, and running a northwesterly course, empties into the North Fork, in Sangamon county. These streams are bordered by large and fine bodies of timber, consisting of white oak, black oak, over-cup, walnut, hickory, etc.

The soil is a black loam, mostly mixed with sand, making it a deep, rich soil, that is not surpassed in the world. The staple crops are corn, wheat and oats; but large portions of the land are used for pasturage. Its large pastures of blue grass, and its fine grass prairies, affording as excellent a range for cattle, horses, sheep, hogs, etc., as can be found in the State.

Table showing value of horses and other animals, as assessed for the years 1861, 2, 3 *and* 4.

	1861.	1862.	1863.	1864.
Horses, value.....	$155,268	$130,573	$149,028	$174,746
Mules, "	26,645	16,415	18,432	20,222
Cattle, "	91,036	92,034	117,088	122,012
Sheep, "	7,701	10,257	16,046	30,834
Hogs, "	44,537	26,379	30,340	16,863

Table showing number of acres in cultivation for the years 1861 ,2, 3 *and* 4.

	1861.	1862.	1863.	1864.
Corn, acres.....	51,374	45,764	44,954	46,758
Wheat, acres.....	17,869	26,058	21,928	16,968
Other products, acres.....	9,825	7,318	6,248	7,389

The decrease of acres in cultivation in the three last years, if reported true by the assessors, exhibits the drain of the great war upon the labor of the county, for there have been many new farms inclosed in the same period, although the table shows nearly 9000 acres less in cultivation in 1864 than 1861; many acres, formerly in cultivation, must have been turned to meadow and pasture.

The sales and exports of corn, wheat, oats, hogs, horses, mules, and cattle, especially of the latter, have been large during the same period; but no reliable data of the amounts are at hand.

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A County Agricultural Society was organized in 1856, and has held annual Fairs ever since. The Society has excellent Fair Grounds, 15 acres, situated within one-half mile of the court house, in Taylorville, the county seat.

The following named gentlemen were the principal officers of the Society for the last four years, viz:

Officers for 1861:

President—J. H. Hill. *Recording Secretary*—V. T. Priest. *Corresponding Secretary*—A. Simpson. *Treasurer*—S. S. Cisna.

Officers for 1862:

President—John S. Frailey. *Recording Secretary*—D. D. Shumway. *Corresponding Secretary*—W. A. Goodrich. *Treasurer*—S. S. Cisna.

Officers for 1863:

President—U. H. McCoy. *Recording Secretary*—D. D. Shumway. *Corresponding Secretary*—S. S. Cisna. *Treasurer*—W. W. Anderson.

Officers for 1864:

President—W. W. Anderson. *Recording Secretary*—L. L. Clark. *Corresponding Secretary*—D. D. Shumway. *Treasurer*—S. S. Cisna.

The railroad facilities for shipping products out and in, are good, on the exterior lines of the county, there being the Terre Haute and St. Louis road on the south, Chicago and Alton on the west, Great Western on the north, and the Illinois Central on the east. The building of a railroad from Pana to Springfield, diagonally through the center of the county, is in contemplation.

D. D. SHUMWAY.

CLARK COUNTY.

Officers for 1863:

President—H. H. Hutchinson.
Vice-President—Robert Brown.
Secretary—Wm. T. Adams.
Treasurer—Lyman Booth.

An Executive Committee was elected, consisting of three from each township.

The Society in this county has had considerable opposition, but its friends have been faithful and energetic. The Society has purchased ten acres of ground and inclosed it with a good board fence, and made other improvements.

W. T. ADAMS.

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BUREAU COUNTY.

The south half of this county is in the coal region, and considerable coal is exported from the vicinity of Sheffield, on the Chicago and Rock Island railroad.

There are several manufactories of plows, etc., in the county.

Many in our county have gone into the raising of flax to a considerable extent. One thing much needed is a manufactory to work up the straw. Our farmers feel this a great drawback. The lint from hundreds of acres is wasted for want of individuals to buy it. No market has been found for it, though individuals have tried in Chicago and various other places to sell it. Yet I have not heard of a single sale at any price, so farmers use it for covering sheds, or burn it. Some good enterprising company might do well in this county by starting a factory to work it up, for thousands of acres would be raised if there were a market for the fiber as well as the seed.

It is generally conceded that much less wheat is sown this spring than in former years, and farmers seem determined to find some crop that will pay the expense of raising, which wheat has not done for years past.

Sorghum and Imphee are considerably raised here, and much good sirup manufactured. I think this branch is a fixed fact with us.

Sheep husbandry is increasing fast, as the statistics show.

Hemp, cotton and tobacco are little raised. The same of sugar beets.

Exports of Agricultural Products by the Chicago, Burlington and Quincy Railroad, for the years 1861–2–3–4.

Articles.	1861.	1862.	1863.	1864.
Wheat, bushels	594,395	317,894	611,210	381,449
Corn "	607,770	1,473,955	942,315	481,183
Oats "	28,756	81,520	221,048	435,321
Barley "	13,696	8,605	26,510	10,915
Rye "	5,268	7,864	9,178	15,465
Potatoes "	1,127	280	.....	178
Broom corn, lbs.	32,894	10,771	28,466	7,973
Grass seed "	21,742	23,388	28,282	103,815
Provisions "	254,480	236,648	93,730	96,356
Dressed hogs "	1,333,444	752,045	1,078,625	552,189
Mill stuff "	877,113	426,984	162,984	193,380
Hides "	115,796	113,035	118,256	242,596
Butter "	51,394	53,747	37,833	41,762
Lard, tallow "	28,491	56,690	36,444	43,299
Wool "	7,398	7,943	22,406	175,416
Cattle, number	2,225	3,015	2,789	3,817
Live hogs "	3,313	15,916	21,762	17,119
Sheep "	59	.....	.....	171
Horses "	28	505	641	50
Flour, barrels	30,908	24,683	19,742	15,762

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List of taxable property in the county of Bureau, State of Illinois, assessed for the years 1861–64.

	1861.	1862.	1863.	1864.
Horses, number	13,873	14,450	15,295	15,063
" value	$332,825	302,612	345,460	386,609
Neat cattle, number	29,973	36,439	33,938	35,037
" value	$158,954	150,270	163,842	200,601
Mules and asses, number	237	282	316	289
" " value	$5,624	6,395	6,750	6,853
Sheep, number	3,272	4,706	6,860	13,524
" value	$2,997	3,551	8,328	16,584
Hogs, number	28,842	32,329	42,336	33,975
" value	$529,242	33,269	43,510	39,243
Value of domestic animals	$489,458	536,197	567,890	663,966
Carriages and wagons, number	4,066	4,289	4,530	4,546
" " value	$62,509	66,116	65,778	71,744
Manufactured articles	$4,229	3,401	4,201	7,180
Acres in cultivation—				
Wheat	82,146	93,260	93,227	71,194
Corn	84,518	98,909	78,180	81,277
Other field products	21,148	16,375	19,047	36,429
Value of real estate	$103,659	99,688	133,731	226,143

Officers for 1864:

President—H. C. Fields, Princeton.

Vice Presidents—Enos Smith, Malden; G. C. Weeks, Buda; C. G. Reed, Malden.

Recording Secretary—A. Bryant, jr., Princeton.

Corresponding Secretary—S. G. Paddock, Princeton.

Treasurer—B. S. Ferris, Princeton.

Directors—Chas. Spear, Sheffield; M. L. Goodspeed, Wyanet; A. Cook, Tiskilwa; J. T. Thompson, Princeton; John Robinson.

E. S. PHELPS, Jr.

CLINTON COUNTY.

Officers for 1861:

President—O. B. Nichols.

Vice-Presidents—B. Rutherford, J. J. Stephens, J. K. Souter.

Corresponding Secretary—Z. Case.

Recording Secretary—C. C. McGinnis.

Treasurer—John Clabaugh.

DEKALB COUNTY.

REPORT FOR 1862.

This long and well established Agricultural Society has continued during the two years, 1861 and 1862, to do what it could

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toward the promotion of the agricultural interests of the county, and, it is thought, with very good success.

The general character of the stock of this county has improved to a wonderful degree during the last five years, and while this society would not demand all the credit for this improvement, it still claims to have largely contributed toward it. Few counties in this or any other State can exhibit a better class of Durhams and Devons. In swine, the average quality is better than in any other section within our knowledge. Sheep are rather neglected; but the few flocks we have, are generally of excellent breed. We raise, yearly, thousands of horses—but few of superior excellence. No doubt we shall improve on them, as well as we have in other branches of husbandry.

Our society has had its usefulness somewhat abridged by a general impression which seems to have prevailed, that the object of the existence of an agricultural society is merely to hold a showy and pecuniarily successful yearly fair. These societies should have a far better and more useful object and end. No doubt, it will be seen, in time, and these better objects attained.

The annual meeting of the society, for 1860, was held, in pursuance of its constitution, at the court house, in Sycamore, from whence it adjourned, for convenience, to a private hall. The following officers were chosen:

President—John S. Brown.
Vice President—James S. Glidden.
Treasurer—William A. Nickerson.
Recording Secretary—T. C. Wetmore.
Corresponding Secretary—A. K. Stiles.
Executive Committee—J. B. Orput, Henry Joiner, S. G. Rowan, N. Saum, H. E. Allen.
Counsellors—N. S. Greenwood, Moses Dean.

An exhibition and trial of Mowing and Reaping machines was held at Henry J. Joiner's farm early in the harvest season, under the auspices of the society. A large number of machines, from the most famous manufacturers in the country, were present, and exhibited their various excellent points. Much interest and amusement was excited by the appearance of the first Reaper ever brought to this county, of the old Hussey patent, 18 years old, and yet in good running order. Another interesting machine was the Reaper patented by Messrs. Marsh, of this county, upon which two men stood and bound the grain as it was cut. It worked well. The prizes of the contest were given: For reaping, first premium to Palmer & Williams' self-raker; second premium to McCormick's. For mowing, first premium to the "Kirby" harvester; second premium to the Buckeye Mower.

For the grand annual Fair of 1860, our society made extraordinary preparations. About three times the usual amount was

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offered in premiums; new buildings were erected, and the citizens of adjoining counties were freely invited to compete for all our prizes. A good degree of interest was aroused throughout the county, and as a result of these exertions, in spite of the all engrossing claims of our national election and its accompanying mammoth gatherings, we had by far the best and most prosperous fair ever held in the county. The stock and goods exhibited were of finer quality, the entries more numerous, the attendance and receipts larger, and its treasury left fuller than ever before.

The annual meeting of 1861 was very fully attended. A proposition came up for a change of location of the society to some grounds at the village of DeKalb, which, after a long and spirited discussion, was voted down. Secession being about this time in fashion, and some members feeling themselves aggrieved at this action, they publicly seceded from the society, with the view of forming a society at DeKalb. The following list of officers were then chosen:

President—John S. Brown.
Vice President—J. R. Crossett, Pampas.
Recording Secretary—Henry L. Boies, Sycamore.
Corresponding Secretary—Wm. H. Beavers.
Treasurer—Wm. A. Nickerson, Mayfield.
Executive Committee—John B. Orput, H. J. Joiner, Stephen Rowen, John Russell, J. N. Maxfield.
Counsellors—John Gilkerson, N. S. Cottrell, T. J. Humphrey.

A new feature in the operations of the society this year was the holding of a show of Stallions in early spring, at the season when such animals are used. It resulted in a decided advantage to stock raisers in the county, and to the recipients of premiums.

The annual fall fair for 1861 opened under very favorable auspices. Its entries were even more numerous than the year before, and the attendance and display of articles better. Everything promised an admirable and highly prosperous exhibition. But alas! for the uncertainty of human hopes, the evening of our second day was signalized by the most tremendous storm ever known in this country. The whole country was flooded, and although our Fair was not broken up, its receipts were materially diminished and expenses increased. This misfortune, which seems to have

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REPORT FOR 1864.

This society was organized in 1861, under the following circumstances: There had previously been a society located at Sycamore. In 1859 they appointed a committee to select new grounds. Said committee located on the grounds now used by this society, near the village of DeKalb. Sycamore refused to sanction the report of their committee.

In January, 1861, at a called meeting of those interested in agriculture and the mechanic arts, held at DeKalb, the following officers were elected and a new society formed:

President—J. F. Glidden, DeKalb.
First Vice President—N. Saum, Kingston.
Second Vice President—M. V. Allen, Shabbona.
Treasurer—Harvey Thompson, DeKalb.
Secretary—J. W. Smull, DeKalb.

At said meeting a constitution and by-laws were adopted. A motion prevailed that the society purchase the fifteen acres of land on which the committee from the old society located. Said land was purchased, and a sufficient amount of money immediately donated to inclose it with a six feet tight board fence and erect suitable buildings, which was immediately done, and the society has been in a very flourishing condition ever since, although the Sycamore society held fairs for two years and then gave up the ghost.

There is also another society held in this county, and is, I am informed, a very prosperous one. It is held at Sandwich, and called the "Sandwich Agricultural Society," four or five towns joining in the enterprise.

We have held fairs each year since organizing, and they have been well attended, considering the number of our citizens who have been called away to fight the battles of the country. We have had, each year, a good show of horses, cattle and sheep. Agricultural implements were, also, well represented.

In 1861 we had a fine display of sugar cane. Since that time, however, there has been but little raised in the county—one reason for which was the lack of machines to work it up that year, discouraging many from again trying it. The next year what was planted was killed by the frost, which still further discouraged the people. I am informed that quite a quantity is to be planted this year, and I hope with better success.

We have had a small show of fruit; but our farmers are investing largely in fruit trees, and, I think, in a few years they will receive an ample reward.

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The following were the officers for 1862 and 1863:

President—J. F. Glidden, DeKalb.
First Vice President—N. Saum, Kingston.
Second Vice President—E. Noble, Afton.
Treasurer—Harvey Thompson, DeKalb.
Secretary—S. O. Vaughan, DeKalb.

The Executive Committee consists of one from each town in the county.

The officers for 1864 were the same as in 1862, except J. W. Smull, of DeKalb, Secretary, who succeeded S. O. Vaughan.

We feel that we are entitled to be classed among the first county societies in the State.

At the annual meeting, in 1863, a motion prevailed that the society hold a reaper and mower trial during the harvest. Such a trial was had in July of that year. It lasted two days, and was very warmly contested. There were twenty-seven machines entered for competition—all of them having their favorites. Those carrying off the honors were J. P. Manny, of Rockford, best Combined Reaper and Mower; Walter A. Wood, best Self-Raker; best Mower, Ball's Buckeye, Ohio; C. W. & H. W. Marsh, of DeKalb county, best Self-Raker and Hand-Binder. This last named machine is considered by good farmers to be one of the best labor-saving reapers now in use. One man riding on the machine does all the binding, saving the labor of two or three men.

The exports of agricultural products, so far as can be ascertained from the best information at command, is: Wheat, shipped from county, in last four years, deducting for consumption of producer, 4,076,500 bushels; corn, shipped during the same time, 4,629,240 bushels; other field products, 3,404,032 bushels. The increase of the last four over the four former years is about twenty per cent.

We have no very extensive manufacturing establishments in the county, A. Adams & Sons', of Sandwich, manufacturers of corn shellers, being the largest.

Messrs. Ellwoods, of Sycamore, have a large flax factory, for making tow carpeting, consuming five hundred tons per year. Of this article there has been a large increase, probably one hundred per cent. last year, and this year there is being some thousands of acres sown.

Wool is largely on the increase. Many of the best and finest

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In DeKalb, as in many other counties, during the last two years, hay has been a great article of export, large amounts having been pressed and shipped in that time—the figures for which I am unable to give at this time.

In conclusion, I will state that it is the opinion of good agriculturists that DeKalb will, in a few years, give a good agricultural account of herself.

S. O. VAUGHAN.

GREENE COUNTY.

REPORT FOR 1863.

The "doings" of the Greene County Agricultural and Mechanical Society having never been reported in the "Transactions of the Illinois State Agricultural Society," a brief report is herewith transmitted for 1863 and 1864:

Officers for 1863:

President—Jos. F. Ballinger.
Vice Presidents—David E. Beatty, E. A. Gilleo, Benj. Roodhouse, W. H. Ellis, Hiram B. Ellis, C. W. Brace, Jacob Bowman.
Secretary—Geo. W. Davis.
Treasurer—J. E. Brace.

The above named officers constitute our executive committee, to whom is entrusted the whole management of the affairs of the society.

The tenth annual fair of this society was held on the grounds, near Carrollton, on the 13th, 14th, 15th and 16th of October, 1863. Entries were more numerous and of greater variety than at any previous exhibition.

Receipts for the year, all sources	$2,823 58
Expenditures	1,892 47
Leaving balance of	$931 11

REPORT FOR 1864.

Officers:

President—Jos. F. Ballinger.
Vice Presidents—Geo. L. Burruss, J. I. Thomas, C. W. Brace, Wm. H. Ellis, D. E. Beatty, E. A. Gilleo, Benj. Roodhouse.
Secretary—Geo. W. Davis.
Treasurer—J. E. Brace.

The eleventh annual Fair was held from the 4th to the 7th of October, inclusive. The entries and receipts were larger than

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ever before. A finer display of stock and articles on exhibition than we have had at any previous fair—making it, in all respects, the most successful and interesting exhibition ever given by our always successful association.

Amount on hand from last year, and receipts for 1864..	$3,220 15
Expenses.....	2,368 46
Balance on hand.....	$851 69

A showing that will, doubtless, compare favorably with any county fair in the State, considering size and population of the county.

Our society is now out of debt, and owns twenty acres of well situated ground, on which the fairs are held. The grounds are well fenced, and well improved, lying one mile and a quarter east of Carrollton, and three quarters of a mile east of the St. Louis, Jacksonville and Chicago railroad, which is rapidly nearing completion, and will be finished this coming summer.

Our next fair will be held in September, commencing September 26th, and continuing five days.

—

I have already forwarded reports of our society for 1863 and 1864. Cannot furnish an *estimate* of exports, we have had no railroad, and statistics of this kind cannot be furnished from this county.

No particular changes have occurred in production of crops. No flax, hemp, cotton, tobacco, African sugar cane, or sugar beets of any consequence, are raised in this county. The production of wool is largely increased. Chinese Sugar Cane is also being raised more largely than in former years.

The estimated wheat crop for 1864, is 565,000 bushels; corn, 1,220,000 bushels.

I am sorry that I cannot furnish the information you desire, but it is impossible. I will lay the matter before our Executive Committee at their next meeting.

GEO. W. DAVIS.

—

EXTRACTS FROM THE REPORT OF THE EXECUTIVE COMMITTEE OF THE GREENE COUNTY AGRICULTURAL AND MECHANICAL ASSOCIATION FOR 1864.

* * * * The year just closed has seen your eleventh exhibition, and, as before remarked, the most successful one ever before held. There is everything in this to encourage you. Through the instrumentality of this Association, invaluable improvements have been introduced in all descriptions of farming implements—marked and beneficial improvements made in the breeds of horses, cattle and hogs, and an impetus has been given to sheep breeding

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that is certain to result in an immense and profitable benefit to our citizens and our county. Let us then sustain our State and County Fairs—cause them to extend their beneficial results to every corner, and we shall see still further improvements in all labor-saving machines—through them shall still be increased and improved our stock and productions of the orchard and the farm, until our Prairie State becomes one vast provision depot, the granary of a world. And from her shall extend vast arteries of commerce, bearing to other lands and to other climes supplies from her inexhaustible stores. Year after year has our noble State increased in population and productions, until now over her entire extent, over prairie and woodland, over hill and over dale, the billows of plenty and prosperity are irresistibly rolling, and the end is not yet. The mightiest march of improvement has not reached us, the wave which is to bear us onward has not appeared on our horizon, but we can feel its swelling, and its coming tide will carry us up higher; and not only so as an agricultural people, but will increase and highten in us all those rural virtues which ennoble and bless mankind, to which the peaceable pursuits of agriculture are but the handmaids. The followers of these pursuits and the benefactors of this class are ever remembered. The name of the person who invented the plow, that simple implement of agriculture, of which so little is thought, yet with which so much is accomplished, is unknown, simply because it was in its earlier use so rude in its construction and so limited in its results, and gradually becoming improved through necessity. Yet, if at any one time it had been presented to the world in its present form of usefulness through the inventive genius of a single individual, his name would have been immortalized, and the laurel wreath of fame which would have encircled his brows would ever have remained too green to be dimmed by that even of the warrior hero, whose name stands highest and shines brightest in fame's historic roll.

The saying has become common as true, that he who causes two blades of grass to grow where only one grew before, is a public benefactor, and to such a result in an increased degree may we look from the effects of our agricultural societies. No great or marked improvement can ever be wrought in the habits or usefulness of a people without a united, combined effort; and we of a county, by uniting together as one man in our local societies, can unite with other counties of our State in a State Society, and again in a grander union of State Societies, eventuating in a National Association, having for its object the same end to which we in our little community, in a narrowed circle, are striving to attain.

The greatest wealth and the highest degree of civilization, are always found in those countries where the best improved system of agriculture prevails; and the horn of plenty is ever largest and fullest where the most improved modes of tillage are understood and practised. And in fact, this department of industry is the

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very ground work of civilized society, and furnishes in itself the bone and sinew of the social structure.

> "Princes or lords may flourish or may fade;
> A breath can make them as a breath has made;
> But a bold yeomanry, a country's pride,
> When once destroyed, can never be supplied."

Let everything possible then be done to encourage and sustain this class of our citizens. In their prosperity all prosper, in their adversity, all fail. * * * *

GRUNDY COUNTY.

REPORT FOR 1861–64.

The Grundy County Agricultural Society held their Seventh Annual Fair at Morris, commencing October 1st, 1861.

Officers for 1861:

President—Wm. T. Hopkins.
Treasurer—E. S. Williams.
Secretary—Morgan L. Lloyd.

This Fair, owing to the war excitement, was not so successful as was desired.

Officers for 1862:

President—Uriah B. Couch.
Treasurer—Arnold M. Cleveland.
Secretary—Theron A. Conklin.

The board of managers deemed it inexpedient to hold a fair this year.

Officers for 1863:

President—George Fisher.
Secretary—John B. Davidson.
Treasurer—Arnold M. Cleveland.

The Ninth Annual Fair was held at Morris, commencing October 14th. This fair proved a success.

The Tenth Annual Fair was held at Morris, in conjunction with

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The exports of agricultural products for this year, were as follows:

Corn	729,971	bushels.
Wheat	27,979	"
Oats	253,576	"
Timothy Seed	31,284	"
Rye	10,788	"
Barley	6,480	"
Butter	173,257	pounds.
Eggs	50,884	dozen.
Coal	86,243	tons.

The shipments for 1865 will, in many articles, double that of last year, especially in the article of corn. And the increase in coal will, probably, be doubled this year. Our principal grain product is corn. Our only mineral product is stone coal, of which we have exhaustless beds, of the very finest quality in the State. There have been no material changes in kinds of crops or products, except tobacco, of which small quantities are being raised.

PERRY A. ARMSTRONG.

HANCOCK COUNTY.

REPORT FOR 1864.

Soon after the organization of the Society on the joint stock plan, the directors purchased of Mr. George Carlton thirteen acres, (which includes the old Fair Grounds,) at $100 per acre; they also purchased three acres on the north side, for hitching and camping ground, at $50 per acre, making the total purchase $1,450. Mr. Carlton subscribed $100 in stock, and the directors gave their notes for $1,350 in the name of the society, payable in one, two and three years, with six per cent. interest, taking a deed for the premises and giving a mortgage to secure the payment. There has been paid on subscriptions of stock between $800 and $900; the receipts from the Fair, including the $100 received from the State, a little over $1,000—making the receipts from all sources about $1,900. The expenses have been, for lumber and improvements on the ground, between $1,100 and $1,200; for premiums and expenses upon the Fair, $850, leaving a deficit against the society of about $150. To meet this, there is yet unpaid upon the stock subscribed about $600. Efforts are being made to collect this and

a very handsome dividend after the improvements are made and the ground paid for. Even this year, notwithstanding the loss on the fourth day, occasioned by the inclemency of the weather, the receipts would have paid from fifteen to twenty per cent. on the stock paid in, after paying all the premiums and all other expenses of the Fair.

But dividends are only a secondary object of the society. To develop the resources of the country; to encourage the introduction of the best and most profitable breeds of cattle, horses, sheep and hogs; to cultivate a taste for the useful, the ornamental and the beautiful; to make our annual Fairs, in interest and importance, second only to that of the State, is the main object of the stockholders; and to this end we invite the co-operation of every citizen who wishes to see the consummation of these worthy objects.

Our Tenth Annual Fair, notwithstanding the inclemency of the weather on the two last days, was, in some respects, the most successful one ever before held in the county. The attendance on the first day was slim, but the number of entrances made in the different classes, by persons from every section of the county, gave unmistakable evidence that the right spirit prevailed, and the attendance would be large. We were not disappointed. The attendance on the second day was larger than usually attends our county Fairs; over three hundred dollars were received for tickets alone. But on the third day there was a perfect rush, the lowest estimate of the number of persons present being five thousand.

It was very gratifying to see the large increase in articles of domestic manufacture—flannels, jeans, linseys, etc. The exhorbitant prices of cotton and woolen fabrics, occasioned by the war, has forced many of our intelligent farmers back to first principles, and the music of the spinning wheel and loom is heard in many neighborhoods of the county. Our farmers are learning to become more self-reliant, and consequently more independent of "King Cotton," and of the grasping avarice of eastern nabob manufacturers, who are making fabulous fortunes off the government and the hard toils of western farmers.

There was a piece of sheeting, manufactured by Mrs. Perkins, of Pilot Grove, a venerable lady of over seventy years of age, from cotton raised in the county by her son, Mr. J. S. Perkins, a worthy citizen of the same township. From his experience there is no

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half to four feet apart. The seed should be put in about the first of May. This year, however, owing to the wet weather, Mr. Perkins did not plant till the 26th of May; and yet, at the time of our Fair he had obtained the second picking. He uses a small plow at the first plowing, being careful to scrape the soil from the stock to prevent what is called the "sore skin," a disease to which the plant is subject, and which makes its appearance in dark spots on the stalk near the surface of the ground. After cultivation, the same that is given to corn.

G. M. CHILDS.

HARDIN COUNTY.

I herewith send an imperfect statement of the agricultural products of Hardin county. We have never had any organized county agricultural society:

The production of Irish potatoes has exceeded in quantity, within the last two years, double that of any previous two years, and will reach, perhaps, over 125,000 bushels per year; all on account of the high prices.

Wheat and corn have nearly doubled.

An increased quantity of flax has been raised.

Increased quantity of wool.

About 10,000 pounds of cotton raised. Previous to this time there was not exceeding 500 pounds of cotton raised in the county.

No very material change in the quantity of tobacco.

Of sorghum, or Chinese sugar cane, there has been an increased quantity raised within the last three years, amounting to, perhaps, 1000 per cent. over any previous three years.

These facts I have gathered from merchants and trading men in our midst, and I think I am not far wrong. I hope, ere long, we will have an agricultural society in operation.

JAMES M. WARREN.

JEFFERSON COUNTY.

The export of agricultural products of the county has not been so great the past year (1864) as during other years. Flour and wheat have been the principal, indeed the only, products exported; but as to the amount I am not able to say. The surplus of corn and hay is fed to stock, and the stock shipped or driven to market. These amount to considerable, although not so great as in some former years.

There has been a great advance in the last few years in the mode and manner of tilling the soil in this county. An increase in the

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use of machinery and an increased yield per acre. There has also been a material increase in the manufacturing interests of the county, but no change in the various crops, except probably, an increased production of wheat and cotton. Sweet potatoes are being more universally raised than formerly. Flax and hemp are but little raised. Tobacco, not so much as a few years ago. Sugar cane has somewhat increased in quantity, and there is a very great improvement in the quality of the molasses. Sugar beets are not cultivated at all.

Corn is, of course, the staple of the county, and, I think, from present appearances, will be greatly increased this year, notwithstanding the extremely wet spring, which tends to make corn late.

E. E. WELBORN.

JO DAVIESS COUNTY.

Officers for 1864:

President—E. H. Bebee.
Vice Presidents—John Adams, S. T. Napper, H. Tyrrell.
Corresponding Secretary—J. B. Brown.
Recording Secretary—R. S. Norris.

UNION AGRICULTURAL SOCIETY OF JO DAVIESS, STEPHENSON AND LAFAYETTE COUNTIES.

REPORT FOR 1863.

At a meeting of the Union Agricultural Society of JoDaviess, Stephenson and Lafayette counties, held in Warren, on the 2d of December, 1863, the following officers were elected for the ensuing year:

President—George Schellenger.
Vice Presidents—Milton Claypool, Wm. Corning, Samuel Cole.
Corresponding Secretary—A. M. Jones.
Recording Secretary—Charles Cole.
Treasurer—N. B. Richardson.

Statement of Receipts and Expenditures for the year 1863.

RECEIPTS.

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EXPENDITURES.

Paid old demands	$236 34
Current expenses	456 55
Paid premiums	655 00
Total expenditures	$1,347 89
Balance on hand	$146 61

A. M. JONES.

LA SALLE COUNTY.

REPORT FOR 1861.

Officers for 1862:

President—H. L. Brush.
First Vice President—R. Debolt.
Second Vice President—E. Baldwin.
Third Vice President—Louis Soule.
Corresponding Secretary—Frank Crawford, Ottawa.
Recording Secretary—E. L. Herrick, Ottawa.
Treasurer—T. R. Courtney, Ottawa.
Executive Committee—W. M. Poole, P. Donlevy, J. B. Howe, J. F. Nash, J. P. Wiswall, J. Lawrence, M. Budd, A. Wolford, H. K. Parr.

Never since the organization of our County Agricultural Society has there been such a combination of untoward circumstances, so many prominent obstacles to success.

Early in the season a large number of our people seemed stricken with madness or infatuation, and, covertly at first, but afterwards openly and boldly, attempted to destroy that kind and paternal government which had always fostered and protected them, and under whose judicious care the nation had increased and prospered with a rapidity unparalleled in the history of nations. And as State after State, upon whose bonds many of our banks were based, fell into the snare set for them by unprincipled leaders and madly rushed on to ruin, our banks began to topple and fall, carrying ruin to many an honest man, till, finally, there was scarcely a bank in the State worthy of confidence, and Illinois currency was numbered "among the things that were." These causes naturally

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every one else, as their balance sheets on the approaching New Year's day will most clearly show.

Next in order on the list of evil influences came the so-called "National Horse Show," which our board of managers, acting as they believed, for the interest of the society, permitted to use our Fair Grounds for their exhibition. Without stigmatizing the concern as an unmitigated humbug, (as many are quite ready to do) I can but believe that it was the means of diminishing our receipts greatly, for many persons attended at that exhibition, supposing it to be part and parcel of our own, while others, having exhausted their spare funds at that show, had nothing to spend at ours. Without referring in detail to the drinking, gambling and betting, openly permitted by the horse show managers, the evil effect of which was felt by us, I cannot hesitate to express my conviction that the concern did us great injury, and that such will always be the effect on any agricultural society near which its exhibitions are held.

The President having appointed a day of fasting and prayer (the need of which was apparent to every one) on one of the days first set for our Fair, the managers postponed it for one week, and we went forward making preparations, with great *apparent* confidence, which, perhaps, would not have been greatly misplaced, had not the weather proved unpropitious, and cold water, in great abundance, been *showered* upon us. As it was, still another postponement was inevitable; and, although the attendance on the final winding up, was by no means as large as it should have been, our net receipts on that day were somewhere in the region of one hundred dollars.

When we review all this, and remember that our premium list was one or two hundred dollars larger than usual, that we paid about one hundred dollars of last year's debts, and that, after all, we have paid our premiums in full and nearly or quite all of the working expenses, I think we have reason to congratulate ourselves on succeeding so well as we have done.

As this is undoubtedly the last report I shall ever have the honor of making to you, being engaged, as you are aware, in the service of our country, and as I have ever felt, and still feel, a great interest in the welfare of our society, you will, perhaps, pardon me if I make a suggestion or two, which, although they may be without value, will still serve to show that I have not ceased to care for the prosperity of our society.

And first it occurs to me that our premium list needs pruning and amending very greatly. Most societies have ceased to offer third premiums. We still offer them, although they might better

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paid in cash to them; for unless we can in some manner, induce them to exhibit, our shows will be deprived of one very interesting element. I am sorry to say I have observed a marked diminution in the number of articles of ladies' manufacture.

I did intend to offer some suggestions with regard to offering premiums for field crops, and especially for any new article of produce, such as sorghum sugar, tobacco, cotton, etc., which might be proved to be remunerative; but I have not time, and will close this too long report by thanking you for the kindness and courtesy which has almost universally been shown me by both officers and the members generally.

J. O. HARRIS.

LOGAN COUNTY.

Officers of the Atlanta Union Agricultural Society, for 1863:

President—A. C. Barnes, Logan county.
Secretary—S. D. Fisher, " "
Treasurer—A. N. Dills, " "
Directors—A. D. Downing, A. N. Dills, James Barr, Logan county; John H. Burt, Tazewell; J. A. Pitts, A. J. Ludlam, McLean; Isam S. Atchison, DeWitt.

MARION COUNTY.

REPORT FOR 1861.

The Sixth Annual Fair of the Marion County Agricultural Society began on Wednesday, September 25, 1861, under very favorable circumstances. The weather throughout the exhibition was very pleasant, with the exception of the last day, (Friday) which was rather stormy and disagreeable, in consequence of which, and as there seemed to be a desire among the people to continue the exhibition until all were satisfied, it was determined by the board to prolong the Fair until Saturday night, the 28th.

The show of cattle and horses at this Fair were far better and larger than at any former exhibition in Marion county, comprising selections of the best stock the county affords, including several

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somehow there does not seem to be that interest manifested in these departments, by our citizens, that should be, to be in keeping with the balance of the Fair, and make our exhibitions what they should be.

The fruit and farm product halls were never so superbly decorated with delicious peaches, apples, pears, quinces, canned and preserved fruits of every variety, and best qualities, as on this occasion. Egypt is *the* fruit growing country of the Northwest, and if any one doubts, let them visit this region during "fruit season."

The displays of farm products, such as spring and winter wheat, corn, oats, tobacco, potatoes, (Irish and sweet) were superb, and such only as Egypt can show. The improvements made in these departments by our farmers, of late years, is surely creditable, and deserves encouragement.

Altogether this Fair was a complete success; but, unfortunately, pecuniarily it was a failure. This was no doubt the results of a good design on the part of the board, in endeavoring to make the expenses of attending this exhibition as light as possible on the people, by reducing the admission fees at the gates from the former rates, which, notwithstanding the good intended, worked to serious disadvantage to the society, pecuniarily. The attendance throughout the Fair was as large, if not larger, than at the former exhibitions of the society; so this pecuniary embarrassment cannot be attributable to a lack of interest on the part of the people. The next annual county Fair of Marion, it is hoped, and not without reason, either, will be the grandest and best county exhibition ever held in this part of the country.

The following is a list of the officers of the Marion County Agricultural Society, for the year 1861:

President—Reuben Chance.

Vice Presidents—Basil Metcalf, James Wilson, A. J. Pearcy, A. Shanafelt.

Secretary—E. L. Merritt.

Treasurer—James L. Martin.

General Superintendent of Grounds—W. D. Vansant.

Managers—J. P. Huff, J. J. Bennett, Wm. Perriman, Urial Mills.

Officers for 1864:

President—A. J. Pearcy.

Vice Presidents—Samuel B. Arnold, A. A. Frew, John Cunningham, E. S. Rosebraw.

Secretary—E. L. Merritt.

Treasurer—John B. Kagy.

Managers—Solomon Siple, S. M. Phelps, James W. Primmer, W. M. Howell, Dr. James A. Davenport.

General Superintendent of Grounds—Urial Mills.

Delegates to State Society—A. J. Pearcy, Solomon Siple, Samuel Stevenson, Reuben Chance.

E. L. MERRITT.

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MACOUPIN COUNTY.

ANNUAL REPORT OF THE EXECUTIVE BOARD OF THE MACOUPIN COUNTY AGRICULTURAL AND MECHANICAL SOCIETY, NOVEMBER 5, 1863.

Gentlemen of the Society:

One year ago you met in this room and elected your present board of officers, and entrusted to their guardianship the interests of the society for the year past. If, in the course of the year, you have found cause to regret the appointment, the ballot box is now presented to you, and an opportunity given to correct the error. If, on the other hand, the administration of the present board meets your approval, we shall look back upon our year's work with satisfaction, that our time and our means have not been spent in vain.

The year past has been a sad period in the history of our country. War, with all its attendant horrors, has been upon us, and, although our own State has not been the scene of strife and battle, yet we have felt the depressing influences of the struggle. Agriculture has suffered much. Many a hand that has heretofore engaged only in the peaceful pursuits of agriculture, now grasps the sword and musket in defense of our country.

The various means of transportation, which have heretofore stood ready to convey our produce to market, are now overtaxed with other business, and insufficient for the purpose. The privileges of our great rivers and river markets have been snatched from us, and the products of our labor have to be sent almost half across the continent by railroad to find a market. These influences have operated injuriously to the agricultural interests of the country, and anything that has a depressing influence on agriculture will necessarily operate injuriously to agricultural societies and agricultural Fairs.

The executive board indulged the hope, in the beginning of the year, that they would be able at this election to report that the society was out of debt. This desirable result would have been attained only for the large expense necessarily incurred in re-building the improvements which were destroyed by fire during the year—an expense wholly unforseen and unprovided for.

The total receipts into the treasury for the current year have been	$1,409 30
Amount on hand at the beginning of the year	93 70
Making altogether	$1,503 00
Total amount paid out	1,400 87
Leaving balance in our favor of	$102 13

By these figures it will be seen that, although the society has met with reverses, it yet sustains itself, and with judicious management, another year and a successful Fair, all outstanding debts may be paid.

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The executive board would respectfully urge upon the members the necessity of giving a hearty support to the society. Let it not be said that old Macoupin, one of the largest and richest counties in the State in agricultural products, is lagging behind her sister counties in her support of agricultural institutions.

Our Fair the present year, though quite creditable, both in respect to the attendance and the articles on exhibition, was not what it should have been, considering our population and agricultural resources. If our entire farming population were made to feel their interest in the matter, and induced to bring out all their worthy stock and other articles to the Fair, our society would then take its proper position among other societies. To secure these results, it is of the most vital importance that good men be chosen to administer the affairs of the society—men who will attend the meetings of the board and work with it, regardless of personal convenience. And after all this is done, and they have devoted their time and what wisdom they may possess to forward the interests of the society, they will yet fail unless they have the support of the people. Every man who has articles worthy of exhibition, or who has the ability to attend the Fairs himself, is accountable to that extent for the success of the society. Then let us enter upon our new year with the determination that each one of us, and every one of us, will do our whole duty in the matter. And if we do this, and keep that determination, another year will see the Macoupin County Agricultural Society placed in its proper position at the head of like institutions in this part of the State.

Officers for 1864:

President—W. C. Waters, Carlinville.
Vice President—J. C. Dugger, Carlinville.
Secretary—John Tunnell, Plainview.
Treasurer—T. L. Loomis, Carlinville.
Directors—D. McDaniel, D. Gore, Carlinville; M. Olmsted, Shipman; L. Johnson, Buford; H. J. Loomis, Chesterfield.

JOHN TUNNELL.

MORGAN COUNTY.

REPORT FOR 1861–4.

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Secretary—Joseph H. Bancroft, Jacksonville.

Treasurer—Wm. H. Broadwell, Jacksonville.

Trustees—William Richardson, Jeptha Dunlap, George Graff, Stephen Green, Hart H. Massey, James S. Rector, Abram Liter, Jacksonville; Elisha B. Hitt, Exeter; Peter Roberts, Franklin.

Premium lists were published and preparations made for the annual Fair, but it was not held—the 101st regiment Illinois volunteers occupying the grounds during the time.

Officers for 1862:

President—Moore C. Goltra, Jacksonville.

Vice Presidents—James T. Holmes, Stephen Dunlap, Jacksonville.

Secretary—Joseph H. Bancroft.

Treasurer—Felix G. Farrell, Jacksonville.

Trustees—Jeptha Dunlap, C. S. Goltra, Wm. Richardson, H. H. Massey, A. Liter, Stephen Green, James S. Rector, George Graff, Jacksonville; Elisha B. Hitt, Exeter.

The display of stock, mechanical and agricultural productions, this year, (1863) was good, and the Fair a complete success.

Officers for 1863:

President—Moore C. Goltra, Jacksonville.

Vice Presidents—James T. Holmes, Stephen Dunlap, Jacksonville.

Secretary—Edward Scott, Jacksonville.

Treasurer—Felix G. Farrell, Jacksonville.

Trustees—James S. Rector, Wm. Richardson, H. H. Massey, George Graff, A. Liter, Stephen Green, J. Neely, Jeptha Dunlap, Jacksonville; Elisha B. Hitt, Exeter.

The show of stock and agricultural implements good; agricultural productions light, on account of the drought; attendance very large. The trustees report the association out of debt.

Officers for 1864:

President—Jonathan Neely, Jacksonville.

Vice Presidents—Elisha B. Hitt, Exeter; Stephen Green, Jacksonville.

Secretary—Jesse W. Galbraith, Jacksonville.

Treasurer—Felix G. Farrel, Jacksonville.

Trustees—Stephen Dunlap, A. Liter, G. Graff, M. C. Goltra, Wm. Richardson, James S. Rector, Jacksonville; John Prunty, Ashland; Milton W. Rigg, Winchester; William Green, Petersburg.

The Fair Grounds of Jacksonville are highly attractive. They are situated in a beautiful grove west of the town, and contain thirty acres. No pains or expense have been spared to make suitable provision for all descriptions of stock brought to the Fairs held on these grounds. For hogs, sheep, horses and cattle, long and

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comfortable rows of pens and sheds have been prepared, and abundance of water from well and lakelet. Whilst these have been looked after, other apartments have not been overlooked. To Textile Fabrics a building of one hundred feet by forty is devoted. To the Fine Arts, the Picture Gallery, seventy-five by thirty feet, is set apart. Floral Hall, in shape of a cross, is one hundred feet by thirty each way. The Amphitheatre, however, is the crowning glory of the grounds. Eight hundred feet of its circumference, twenty-five feet wide, is covered and seated, and will accommodate ten thousand people. In the centre of the Amphitheatre, the area of which is ornamented with forest trees and evergreens and a beautiful blue grass sward, stands the Pagoda, occupied by the judges and the band.

In 1861 there were shipped from two stations (Jacksonville and Alexander) in this county, 23,109 head of cattle, 50,720 hogs, 109,300 bushels of wheat. In 1862, 27,738 head of cattle, 46,915 hogs, 214,642 bushels of wheat. In 1863, 43,231 head of cattle, 41,285 hogs, 189,641 bushels of wheat. In 1864, 39,471 head of cattle, 44,935 hogs, 122,110 bushels of wheat.

There are several other stations in this county where cattle, hogs and grain are shipped, but we have not been able to get access to the books for the years reported. The shipments of wheat are probably not half reported; of cattle and hogs, perhaps two-thirds. The shipment of corn is not reported, because a reliable statement was not available, but it is large.

This county, being the "center of the world," and the *garden spot of the State*, the "material developments" are chiefly agricultural, and have been developed to some considerable extent, but not to one-half of its capacity for agricultural productions.

Flax, hemp and cotton are not raised extensively. Tobacco has been raised, to some extent, for the last three years, but evidently will not become one of the staple productions. The wool crop is steadily increasing. The Chinese sugar cane crop has steadily increased, evidently gaining a permanent hold as one of our staple productions, making good molasses and sugar. The amount raised we are unable to state, but it is large, and pays well.

PIKE COUNTY.

This county, lying between and upon the Illinois and Mississippi

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there being within its confines sufficient of this valuable article for consumption for many years to come. Having within its limits no large towns or cities, the great bulk of the population is devoted to agricultural pursuits. There are, however, in the county several iron foundries, one woolen manufactory, and a half dozen or more steam flouring mills, which export a large quantity of flour. There are no means at my command to determine the value of the exports, as most of the grain and flour is shipped to St. Louis from the many small shipping points upon the two rivers. There is, too, a large trade with Hannibal, Missouri, and Quincy, Illinois, from the northwest part of the county, the farmers hauling directly to those markets the products of their farms. Many, too, are in the custom of shipping their own grain, cattle, hogs, etc., to market, without the intervention of the "middle men," as they are termed. The character of our farming has changed very much within the last eight or ten years. More attention is paid to stock raising and grazing than heretofore. A much larger amount of farm products finds its way to market on foot, in the form of fat cattle, hogs, and sheep, than formerly, and buyers from Chicago and St. Louis are constantly in our midst, picking up the small as well as the large articles for sale by the farmer. A large portion of the hogs fattened in the county go directly to Chicago or St. Louis, to be slaughtered; whereas formerly nearly all were slaughtered and packed here at home. The high price of wool, for the last few years, has caused much attention to be paid to sheep raising, and there are now many large flocks in the county where but few existed before. But the greatest increase in the production of a single article in the county is in that of tobacco. In 1860 there were raised about 50,000 pounds, and each successive year has witnessed an increased production, until the crop of last year (which was partially a failure) is estimated by our most prominent manufacturer at one million pounds. There will be this year (1865) fully double that amount raised in the county. There is, too, a large increase in the raising of the Chinese and African sugar cane, although no sirup or molasses, or, at any rate, no great amount, finds its way to a foreign market. But this year will witness a largely increased production of the article, I think fully one-half more than ever before. While devoting their attention to these articles, our farmers do not, however, neglect the cultivation of the usual crops heretofore raised; and, although for two or three years past, hired laborers have been scarce and wages high, yet, by the assistance of the reaper, the drill, the corn planter, the cultivator, and other labor-saving machinery, but little if any land has been suffered to lie idle, and the fruitful earth has been caused to bring forth her crops, each in its due season, as though wars and discord and confusion were not, and peace reigned in our beloved land.

Our Agricultural Society, which has been in existence some twelve or fifteen years, is in a flourishing condition, and has held

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a Fair every year since it was organized, save one, (1862.) It is an institution now firmly established in the affections of our people, and has been the means of great good to our community. Its officers for the last four years have been as follows:

Officers for 1861:

President—B. F. Westlake.
Vice Presidents—T. Bradbury, Wm. Turnbull.
Secretary—J. M. Bush.
Corresponding Secretary—C. R. Lame.
Treasurer—T. A. Hubbard.

Directors—D. A. Fagan, N. Kelly, G. W. K. Bailey, J. W. Bush, Jesse Long.

Officers for 1862:

President—Thomas Bradbury.
Vice Presidents—A. E. McNeal, N. Kellogg.
Secretary—C. R. Lame.
Corresponding Secretary—J. M. Bush.
Treasurer—M. Ross.
Directors—Jesse Long, George Stebbins, J. W. Brown, John Hull, John Lasbury.

Officers for 1863:

President—A. Barber.
Vice Presidents—D. A. Fagan, N. Kellogg.
Secretary—C. R. Lame.
Corresponding Secretary—J. M. Bush.
Treasurer—S. Grigsby.
Directors—Jesse Long, George Stebbins, John Lasbury, J. W. Brown, John Hull.

Officers for 1864:

President—J. M. Bush.
Vice Presidents—John Lasbury, R. Anderson.
Secretary—A. Sanders.
Corresponding Secretary—G. W. Jones.
Treasurer—S. Grigsby.
Directors—Jesse Long, E. D. Rose, D. A. Fagan, Dan Bates, Thomas Harris.

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AGRICULTURAL STATISTICS OF PUTNAM COUNTY, ILLINOIS, FOR THE YEAR 1864.

TOWN OF GRANVILLE.	SCHOOL DISTRICTS.						TOTAL.
	No. 3.	No. 5.	No. 6.	No. 7.	No. 8.	No. —	
f pasture							
f meadow							
hay	545½	434	229½	277	468	208	2162½
	186	213	280	164	207	99	1099
of grass seed	137½	245	289	211	240	51	1173½
	10	20	.....	.....	.....	24	54
s:							
wn	273½	447	475	306	601	58	2160½
harvested	2955	6289	6784	5194	6844	821	28,887
ts:							
wn	7	.....	.....	.....	.....	.....	7
harvested	143	.....	.....	.....	.....	.....	143
wn last fall and now on ground	31	.....	.....	.....	.....	4	35
wn	133½	229	266	245	106	147	1146½
harvested	3062	10,330	13,025	12,562	3925	4758	48,167
own	.....	.....	2	48	1½	4	55½
harvested	.....	.....	42	841	40	60	981
own	30	20	10	41	.....	.....	101
harvested	508	640	300	1312	.....	.....	2760
own	.....	.....	.....	.....	.....	4	4
harvested	.....	.....	.....	.....	.....	100	100
lanted	694	988	908	894	757	485	4726
harvested	15,430	37,580	39,100	39,950	20,656	13,400	166,116

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Statement—Continued.

TOWN OF GRANVILLE.	SCHOOL DISTRICTS.						TOTAL.
	No. 3.	No. 5.	No. 6.	No. 7.	No. 8.	No. —	
Sorghum:							
Acres planted	8½	.....	5 1-6	1½	.....	6½	20.8
Gallons sirup	529	.....	504	253	.....	257½	1543½
Potatoes:							
Acres planted	27½	14	15½	9½	.....	15½	82
Bushels harvested	1357	1030	885	888	.....	592	4752
Peas:							
Bushels harvested	½	.....	.....	.....	.....	.....	½
Beans:							
Acres planted	4	.....	½	.....	.....	½	4½
Bushels harvested	.....	2	1	5	.....	2	10
Root crops:							
Acres planted	.....	.....	.....	½	.....	.....	½
Bushels turnips harvested	36	.....	.....	17	.....	.....	53
Bushels sugar beets harvested	.....	.....	.....	25	.....	.....	25
Bushels carrots harvested	.....	.....	.....	6	.....	.....	6
Flax:							
Acres sown	.....	.....	25	39	.....	.....	64
Bushels seed	.....	.....	240	291	.....	.....	531
Bees:							
Number hives	9	19	26	4	9	19	86
Pounds honey	10	103	120	.....	100	44	377
Pounds wax	.....	.....	3	.....	.....	5	8
Neat Cattle:							
Number cows	85	61	69	53	48	56	372
Other cattle, besides calves	112	151	49	46	32	85	475
Calves raised	38	38	40	29	27	45	237
Number cattle lost by disease	4	1	2	.....	.....	2	9

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Beef:							
Number beef cattle sold	51	14	19	20	5	3	112
Number beef cattle slaughtered	9	4	4	9	10	6	42
Dairy:							
Number cows milked for cheese or sale of milk	.....	6	.....	.....	.....	.....	6
Number pounds cheese	.....	1000	.....	40	.....	.....	1040
Value of market garden produce	.....	.....	.....	$12	.....	.....	$12
Swine:							
Number raised	360	154	296	158	97	176	1241
Number lost by disease	34	11	12	3	.....	6	66
Number sold alive	246	55	86	21	.....	30	438
Number fatted and killed	102	134	95	16	107	152	606
Pounds pork killed	18,245	27,060	20,925	40,900	22,000	34,315	163,445
Sheep:							
Number killed by dogs	54	19	5	9	.....	.....	87
Value of sheep killed by dogs	$310	80	21	100	.....	.....	$511
Number wintered last winter	218	514	209	253	475	.....	1669
Number lambs raised last summer	79	157	81	126	50	.....	493
Number sheep and lambs sold during year	10	115	272	.....	.....	.....	397
Number of fleeces	218	430	7	253	475	.....	1883
Pounds of wool	.....	1695	32	900	1200	.....	3827
Poultry:							
Value of poultry marketed	$18 90	28 00	22 00	15 00	.....	129 00	$212 90
Value of eggs marketed	$3 55	15 00	55 00	52 00	.....	102 00	$227 55
Fruit Crop:							
Bushels of apples	945	110	400	225	275	348	2303
Barrels of cider made	19½	13	9	2	3	13	59½
Bushels dried apples	16½	.....	6	5	.....	10½	38
Fruit trees planted:							
Number of apple trees on farm	1365	1730	1374	685	755	778	6687
Number of pear trees on farm	37	29	18	13	7	12	116
Number of peach trees on farm	507	140	34	17	47	37	782
Number of cherry trees on farm	206	184	199	71	152	182	994
Number of grape vines in vineyard	137	50	40	11	9	.....	247
Number of vines planted current year	16	.....	8	.....	.....	16	35

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Statement—Continued.

TOWN OF GRANVILLE.	SCHOOL DISTRICTS.						TOTAL.
	No. 3.	No. 5.	No. 6.	No. 7.	No. 8.	No. —	
Drainage:							
Rods tile drain	.....	100	45	.....	.....	.....	145
Rods mole drain	.....	3160	.....	2280	.....	.....	5440
Rods board drain	.....	.....	.....	.....	.....	51	51
Rods open ditch	.....	1740	2130	460	.....	60	4390
Buildings:							
Number of houses built this year	1	2	2	.....	.....	.....	5
Value of houses built this year	$400	1100	900	.....	.....	.....	$2400
Number of barns built this year	1	1	2	.....	.....	.....	4
Value of barns built this year	$35	300	650	.....	.....	.....	$985
Horses:							
Number of colts raised	16	20	17	11	16	13	93
Number of horses on hand	108	164	104	69	110	59	614
Number of horses sold	15	27	9	9	16	12	88
Value of horses sold	$1620	2622	975	975	1755	1215	$9163
Mules:							
Number of mules on hand	.....	.....	.....	.....	1	.....	1

TOWN OF HENNEPIN.	SCHOOL DISTRICTS.					TOTAL.
	No. 1.	No. 2.	No. 3.	No. 5.	No. 9.	
Grass Lands:						
Acres of pasture	204	213	407	.....	343	1667
Acres of meadow	74½	93	139	10	208	524½
Tons of hay	44	85	109	3	295	536
Bushels of grass seed	.....	.....	7	.....	8	15

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Spring Wheat:						
Acres sown	325	260	117	91	332½	1125½
Bushels harvested	3365½	3044	1282	842	5081	13,614½
Winter Wheat:						
Acres sown	.....	15	25½	2	10	52½
Bushels harvested	.....	150	320	25	137	632
Acres sown last fall, and now on ground	.....	4	35	.....	.....	39
Oats:						
Acres sown	225	148	151½	65	290	879½
Bushels harvested	5829½	4320	2248	1395	1399	25,191½
Rye:						
Acres sown	.....	22	.....	2	10	34
Bushels harvested	.....	240	.....	16	120	376
Barley:						
Acres sown	3	.....	.....	.....	24	27
Bushels harvested	60	.....	.....	.....	505	565
Buckwheat:						
Acres sown	14	.....	.....	1	.....	15
Bushels harvested	15	.....	.....	10	.....	25
Corn:						
Acres planted	885	569	537	297½	910	3198½
Bushels harvested	28,180	21,765	16,555	8375	40,335	115,210
Acres broom corn	.....	.....	.....	¾	.....	¾
Pounds broom corn	.....	.....	.....	590	.....	590
Sorghum:						
Gallons sirup	.....	.....	.....	.....	1400	1400
Maple Sugar:						
Pounds manufactured	.....	.....	.....	.....	600	600
Potatoes:						
Acres planted	58½	60	84¼	10¼	20⅝	223⅝
Bushels harvested	2921	3555	5155	438	1267	13,336
Beans:						
Acres planted	½	2½	½	10¾	¼	14½
Bushels harvested	7½	26	8	93	7	141½
Root Crops:						
Acres sown	.....	3	½	1	.....	4½
Bushels turnips harvested	.....	150	30	50	.....	230

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Statement—Continued.

TOWN OF HENNEPIN.	SCHOOL DISTRICTS.					TOTAL.
	No. 1.	No. 2.	No. 3.	No. 5.	No. 9.	
Flax:						
Acres sown	.....	.....	.....	.....	4¼	4¼
Pounds of lint or straw	.....	.....	.....	.....	4000	4000
Bushels seed	.....	.....	.....	.....	50	50
Tobacco:						
Acres planted	.....	.....	.....	1-60	¼	8-15
Pounds harvested	.....	.....	.....	12	200	212
Bees:						
Number of hives	54	10	78	56	23	221
Pounds honey	420	175	954	209	455	2213
Pounds of wax	18	.....	45	66	.....	129
Neat Cattle:						
Number of oxen	.....	4	.....	.....	.....	4
Number of cows	92	80	75	81	90	368
Other cattle, besides calves	121	203	142	32	122	620
Calves raised	82	54	44	30	69	279
Number of cattle lost by disease	4	.....	8	1	6	19
Beef:						
Number of beef cattle sold	39	67	46	11	34	197
Number of beef cattle slaughtered	12	2	8	4	11	37
Dairy:						
Number of cows milked for butter	71	52	46	28	73	270
Number pounds butter	625	2925	2555	204	4080	10,389
Number pounds cheese	300	.....	16	15	490	865
Value of produce market garden	.....	.....	.....	$6 25	370 00	$376 25
Swine:						
Number of hogs raised	261	188	276	99	329	1153
Number of hogs lost by disease	10	4	76	44	90	224
Number of hogs sold alive	27	49	28	11	55	170
Number of hogs fattened and killed	124	77	172	73	240	686
Pounds of pork killed	25,970	.....	35,170	11,975	55,100	128,215

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Sheep:						
Number killed by dogs	.....	.....	7	.....	2	9
Value of same	.....	.....	$30	.....	.....	$30 00
Number of sheep wintered past winter	.....	.....	127	.....	52	179
Number of lambs raised last summer	.....	.....	35	.....	23	58
Number of sheep and lambs sold during year	.....	.....	13	.....	75	88
Number of fleeces	.....	.....	125	.....	52	177
Pounds of wool	.....	.....	350	.....	170	520
Poultry:						
Value of poultry marketed	.....	.....	.....	$5 60	18 50	$24 10
Value of eggs marketed	$17 90	14 00	99 00	16 55	116 50	$263 95
Fruit Crop:						
Bushels dried apples	8¼	11	7	3¼	24	54
Gallons grape wine made	.....	1	.....	.....	.....	1
Value of grapes sold	.....	.....	$75	.....	.....	$75
Value of wine made	.....	.....	$10	.....	.....	$10
Number of gallons fruit wine made	2	.....	.....	.....	.....	2
Value of other fruit	.....	.....	.....	.....	$73	$73
Fruit Trees planted:						
Number of apple trees on farm	1037	1520	2645	304	1825	7331
Number of pear trees on farm	17	47	60	6	28	158
Number of peach trees on farm	78	38	224	30	78	448
Number of cherry trees on farm	230	151	185	106	217	889
Number of grapevines in vineyard	26	1786	1285	80	23	3200
Number of vines planted current year	83	.....	10	80	.....	173
Drainage:						
Rods open ditch	.....	100	.....	.....	473	573
Buildings:						
Number of houses built this year	.....	1	1	2	.....	4
Value of houses built this year	.....	$5,000	.....	$1,200	.....	$6,200
Number of barns built this year	3	.....	.....	.....	.....	3
Value of barns built this year	$1,100	.....	.....	.....	100	$1,200
Horses:						
Number of colts raised	21	11	18	11	28	84
Number of horses on hand	120	78	116	32	179	525
Number of horses sold	15	18	16	3	19	71
Value of horses sold	$1,655	1,617	1,465	200	2,155	$7,092

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Statement—Continued.

TOWN OF HENNEPIN.	SCHOOL DISTRICTS.					TOTAL.
	No 1.	No. 2.	No. 3.	No. 5.	No. 9.	
Mules:						
Number of colts raised	.....	1	.....	.....	.....	1
Number of mules on hand	3	1	.....	.....	1	5
Value of mules sold	$35	40	.....	.....	.....	$75

TOWN OF MAGNOLIA.	SCHOOL DISTRICTS.						TOTAL.
	No. 1.	No. 2.	No. 3.	No. 6.	No. 8.	No. 9.	
Grass Lands:							
Acres of pasture	192	62½	313	422	280	585½	1855
Acres of meadow	172	93	244	225	162	362	1258
Tons of hay	276	101	260	181½	220	439½	1478
Bushels of grass seed	.....	4	1	12½	.....	.....	17½
Spring Wheat:							
Acres sown	303	187	251	370½	314	457	1882½
Bushels harvested	4669	3062	4149	4919	.....	6380	23,179
Winter Wheat:							
Acres sown	.....	.....	8	5	8	.....	21
Bushels harvested	.....	.....	50	60	175	.....	285
Acres sown last fall and now on the ground	.....	.....	9	.....	.....	.....	9
Oats:							
Acres sown	265	117	198	257	247	326	1410
Bushels harvested	14,890	4143	7943	10,916	11,520	14,419	63,831
Rye:							
Acres sown	24	.....	45	22	12	11	114
Bushels harvested	345	.....	469	465	184	220	1683

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Barley:							
Acres sown	72	2	25½	26	8	10	144½
Bushels harvested	1767	55	754	550	373	210	3709
Buckwheat:							
Acres sown	.....	.....	.....	1½	.....	1½	3
Bushels harvested	.....	.....	.....	15	.....	8	23
Corn:							
Acres planted	827	488	583	945	605	1078	4526
Bushels harvested	36, 050	19, 520	20, 960	40, 795	26, 070	51, 205	194, 600
Acres of broom corn	.....	.....	.....	.....	½	15	15½
Pounds of broom corn	.....	.....	95	.....	500	4200	4795
Potatoes:							
Acres planted	11	29	8½	5½	8	12½	74
Bushels harvested	1270	2325	741	873	503	1474	7186
Beans:							
Acres planted	.....	½	1½	½	½	.....	2
Bushels harvested	.....	5	16	210	2	12	245
Root Crops:							
Acres sown	.....	.....	.....	.....	.....	½	½
Bushels turnips harvested	.....	.....	30	.....	.....	36	66
Bushels sugar beets harvested	50	.....	.....	.....	.....	1	51
Bushels carrots harvested	25	.....	.....	.....	.....	.....	25
Flax:							
Acres sown	13½	.....	20	30	15½	19	97¾
Pounds of lint or straw	.....	.....	3908	.....	6000	14, 500	24, 408
Bushels of seed	115	.....	227	246	125	212	925
Tobacco:							
Acres planted	.....	.....	.....	.....	.....	13–40	13–40
Pounds harvested	.....	.....	20	.....	.....	300	320
Bees:							
Number of hives	21	60	48	18	11	30	188
Pounds of honey	425	66	290	150	50	40	1021
Pounds of wax	.....	12	20	.....	.....	3	35

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Statement—Continued.

TOWN OF MAGNOLIA.	SCHOOL DISTRICTS.						TOTAL.
	No. 1.	No. 2.	No. 3.	No. 6.	No. 8.	No. 9.	
Neat Cattle:							
Number of cows	77	67	90	90	72	141	557
Other cattle besides calves	99	119	100	139	183	185	825
Calves raised	39	29	69	63	57	108	365
Number of cattle lost by disease	6	2	1	6	8	9	32
Beef:							
Number of beef cattle sold	25	4	4	38	24	19	114
Number of beef cattle slaughtered	7	6	14	3	12	3	45
Dairy:							
Number of cows milked for butter	67	44	62	62	56	107	398
Number of pounds of butter	2785	1720	4162	48	2695	7689	19,119
Number of cows milked for cheese or sale of milk	3	.....	.....	.....	.....	4	7
Number of pounds of cheese	200	.....	.....	.....	190	120	510
Swine:							
Number of hogs raised	222	241	322	385	178	564	1912
Number of hogs lost by disease	47	18	34	108	14	64	285
Number of hogs sold alive	41	1	50	26	24	117	259
Number of hogs fatted and killed	198	29	212	327	131	18	915
Pounds of pork killed	45,300	4262	44,920	79,890	28,650	25,980	205,616
Sheep:							
Number of sheep killed by dogs	.....	23	.....	.....	5	1	29
Value of sheep killed by dogs	.....	.....	$86	.....	.....	5	$91
Number of sheep wintered last winter	6	170	511	4	473	11	1175
Number of lambs raised last summer	5	44	264	4	288	3	608
Number of sheep or lambs sold during the year	.....	5	18	.....	30	.....	53
Number of fleeces	6	150	511	4	470	9	1150
Pounds of wool	40	540	2463	9	1827	14	4893
Poultry:							
Value of poultry marketed	$101 00	5 40	42 45	.....	12 00	6 87	$167 52
Value of eggs marketed	$193 00	88 00	24 50	89 00	100 30	48 50	$543 30

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Fruit Crop:							
Bushels of apples	2307	1150	473	138	287	624	4979
Barrels of cider made	3½	29	6	2	.....	11½	52
Bushels dried apples	15	5	.....	1	2	9	32
Gallons of grape wine made	.....	.....	.....	2	.....	.....	2
Value of wine made	.....	.....	.....	$8	.....	.....	$8
Number of gallons of fruit wine made	8	.....	.....	6	.....	.....	14
Value of other fruit	.....	.....	.....	.....	$12	.....	$12
Fruit Trees planted:							
Number of apple trees on farm	2703	991	1379	1246	1051	3798	11,168
Number of pear trees on farm	49	11	20	25	36	72	213
Number of peach trees on farm	179	168	162	79	103	377	1068
Number of cherry trees on farm	333	194	198	270	170	373	1538
Number of grapevines in vineyard	122	40	24	21	52	120	379
Number of vines planted current year	.....	26	51	.....	5	.....	82
Drainage:							
Rods of tile drain	45	.....	.....	.....	.....	.....	45
Rods of mole drain	750	.....	.....	.....	.....	.....	750
Rods open ditch	1320	180	787	120	570	.....	2977
Buildings:							
Number of houses built this year	.....	4	2	3	.....	.....	9
Value of houses built this year	$200	2,800	1,550	3,450	.....	.....	$8,000
Number of barns built this year	.....	1	1	2	.....	2	6
Value of barns built this year	.....	$125	400	450	.....	845	$1,825
Horses:							
Number of colts raised	24	24	13	24	16	34	135
Number of horses on hand	138	65	132	136	113	221	805
Number of horses sold	15	5	15	15	14	25	87
Value of horses sold	$1,915	635	1,240	1,435	1,490	2,935	$9,650
Mules:							
Number of colts raised	.....	21	.....	.....	.....	.....	21
Number of mules on hand	.....	.....	.....	.....	.....	4	4

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Statement—Continued.

TOWN 32, 22—SCHOOL DISTRICT NO. 4.

Grass Lands:	
Acres of pasture	74
Acres of meadow	50
Tons of hay	61
Bushels of grass seed	1
Spring Wheat:	
Acres sown	47½
Bushels harvested	541
Winter Wheat:	
Acres sown	80
Bushels harvested	1487
Acres sown last fall and on ground	74
Oats:	
Acres sown	102
Bushels harvested	3849
Rye:	
Acres sown	4½
Bushels harvested	50
Corn:	
Acres planted	377
Bushels harvested	12, 870
Potatoes:	
Acres planted	45
Bushels harvested	2897
Beans:	
Acres planted	1½
Bushels harvested	6
Root Crops:	
Acres planted	½
Bushels turnips harvested	5
Bees:	
Number of hives	21
Pounds honey	40
Neat Cattle:	
Number of cows	43
Other cattle, besides calves	77
Calves raised	26
Number of cattle lost by disease	5
Beef:	
Number beef cattle sold	10
Number beef cattle slaughtered	2

Dairy:	
Number of cows milked for butter	30
Number pounds butter	1200
Value of market garden produce	$65
Swine:	
Number of hogs raised	109
Number of hogs lost by disease	15
Number of hogs sold alive	18
Number of hogs fattened and killed	116
Pounds of pork killed	22, 840
Poultry:	
Value of eggs marketed	$152
Fruit Crop:	
Bushels apples	751
Barrels of cider made	29
Fruit trees planted.	
Number of apple trees on farm	1337
Number of pear trees on farm	15
Number of peach trees on farm	41
Number of cherry trees on farm	25
Number of vines planted current year	293
Buildings:	
Number of houses built this year	1
Value of houses built this year	$200
Number of barns built this year	2
Value of barns built this year	$1, 050
Horses:	
Number of colts raised	10
Number of horses on hand	55
Number of horses sold	2
Value of horses sold	$220

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Statement—Continued.

RECAPITULATION.

	TOWNS.				
	Granville—6 districts	Hennepin—5 districts.	Town 32, 22—1 district..	Magnolia—6 districts.	Total .....
Grass Lands:					
Acres of pasture	2162¼	1197	74	1855	5258¼
Acres of meadow	1099	524½	50	1258	2931½
Tons of hay	1143½	536	61	1478	3218½
Bushels of grass seed	54	15	1	17½	87½
Spring Wheat:					
Acres sown	2160½	1125½	47½	1882½	5216
Bushels harvested	28, 887	13, 614½	541	23, 179	66, 221½
Winter Wheat:					
Acres sown	7	52½	80	21	160½
Bushels harvested	143	632	1487	285	2547
Acres sown last fall, and now on ground	35	39	74	9	157
Oats:					
Acres sown	1146½	879½	102	1410	3538
Bushels harvested	48, 167	25, 191½	3849	63, 831	141, 038½
Rye:					
Acres sown	55½	34	4½	114	208
Bushels harvested	981	376	50	1683	3090
Barley:					
Acres sown	101	27	.....	144½	272½
Bushels harvested	2760	565	.....	3709	7034
Buckwheat:					
Acres sown	4	15	.....	3	22
Bushels harvested	100	25	.....	23	148
Corn:					
Acres planted	4726	3198½	377	4526	12,827½
Bushels harvested	166, 116	115, 210	12, 870	194, 600	488, 196
Acres broom corn	.....	¾	.....	15⅙	15⅞
Pounds of broom corn	.....	590	.....	4795	5385
Sorghum:					
Acres planted	20.8	.....	.....	.....	20.8
Gallons sirup	1543½	1400	.....	.....	2943½
Maple Sugar:					
Number of pounds	.....	600	.....	.....	600
Potatoes:					
Acres planted	82	233⅝	45	74	434⅝
Bushels harvested	4752	13, 336	2897	7186	28, 171
Beans:					
Acres planted	4⅝	14½	1¼	2	22⅝
Bushels harvested	10	141½	6	245	402½
Root Crop:					
Acres sown	¼	4½	⅛	¼	5⅛
Bushels turnips harvested	58	230	5	66	354

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Statement—Continued.

RECAPITULATION—CONTINUED.

	TOWNS.				
	Granville—6 districts.	Hennepin—5 districts.	Town 32, 22, 1 district.	Magnolia—6 districts.	Total.....
Peas:					
Bushels harvested.....	¼	.....	.....	.....	¼
Tobacco:					
Acres planted.....	.....	8–15	.....	13–40	.85
Pounds harvested.....	.....	212	.....	320	532
Bees:					
Number of hives.....	86	221	21	188	516
Pounds honey.....	377	2213	40	1021	3651
Pounds wax.	8	129	.....	35	172
Neat Cattle:					
Number oxen.....	.....	4	.....	.....	4
Number cows.....	372	368	43	537	1320
Other cattle, besides calves.....	475	620	77	825	1997
Calves raised.....	227	279	26	365	907
Number of cattle lost by disease.	9	19	5	32	65
Beef:					
Number of beef cattle sold.....	112	197	10	114	433
Number of beef cattle slaughtered	42	37	2	45	126
Dairy:					
Number of cows milked for butter	282	270	30	398	980
Number pounds butter.....	12, 271	10, 389	1200	19, 119	42, 979
Number of cows milked for cheese or sale of milk.....	6	.....	.....	7	18
Number pounds cheese.....	1040	865	.....	510	2415
Value of market produce garden...	$12 00	376 25	65 00	.....	$453 25
Swine:					
Number of hogs raised.....	1241	1153	109	1912	4415
Number of hogs lost by disease..	66	224	15	285	590
Number of hogs sold alive.....	438	170	18	259	885
Number of hogs fattened and killed.....	606	686	116	915	2323
Pounds pork killed.....	163,445	128, 215	22,840	205, 616	520, 116
Sheep:					
Number of sheep killed by dogs..	87	9	.....	29	125
Value of sheep killed by dogs....	$511 00	30 00	.....	91 00	$632 00
Number of sheep wintered last winter.....	1669	179	.....	1175	3023
Number of lambs raised last summer.....	493	58	.....	608	1159
Number sheep or lambs sold during year.....	397	88	.....	53	538
Number of fleeces.....	1383	177	.....	1150	2710
Pounds of wool.....	3327	520	.....	4893	9240
Poultry:					
Value of poultry marketed.....	$212 90	24 10	.....	167 52	$404 52
Value of eggs marketed.....	$227 55	263 95	152 00	543 30	1,186 80

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—Continued.

TOWNS.

Hennepin—5 districts.	Town 33, 23, 1 district.	Magnolia—6 districts.	Total .....
2635	751	4979	10,668
47	29	52	187½
54	.....	32	124
1	.....	2	3
$75 00	.....	.....	$75 00
$10 00	.....	8 00	$18 00
2	.....	14	16
$73 00	.....	12 00	$85 00
7331	1337	11,168	26,523
158	15	213	502
448	41	1068	2339
889	25	1538	3446
3200	292	379	4119
178	.....	82	290
.....	.....	45	190
.....	.....	750	6190
.....	.....	.....	51
573	.....	2977	7940
4	1	9	19
6,200	200	8,000	$16,800
3	2	6	15
1,200	1,050	1,625	$5,060
84	10	135	322
525	55	805	1999
71	2	87	248
7,092 00	220 00	9,650 00	$26,125
1	.....	21	22
5	.....	4	10
$75 00	.....	.....	$75 00

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PEORIA COUNTY.

Our society is not now in working order, having held no fair since 1860. Our buildings and grounds were, most of the time, during the war, used for barracks for soldiers. Both were much damaged by such occupation, and our claims for damage and loss have never been paid by the Government, which embarrassed the society so they were not able to fit up and hold a fair if the grounds had been unoccupied.

Our county has increased in population and wealth, and we have exported larger quantities for three years past than formerly. We have an increase in growth of flax, wool, tobacco and sugar cane. Many are cultivating the sugar beet with success. More attention is being paid to cultivating fruit, and several flourishing vineyards in the county are paying well.

I regret I cannot give you full statistics of the products and exports of our county. By next season we hope to have our society revived and put in working order.

Officers of Peoria County Agricultural and Mechanical Society:

President—Col. Horace Capron, Peoria.

Vice Presidents—Truman Humphreys, Elmwood; John A. McCoy, Brimfield; H. I. Chase, Peoria; Lorin Wilder, Mt. Hawley.

Ex-Presidents—C. C. Wood, Peoria; E. H. Clapp, Rome.

Recording Secretary—D. J. Berry, Robbin's Nest.

Corresponding Secretary—R. Bills, Peoria.

Treasurer—H. G. Anderson, Peoria.

ROSWELL BILLS.

RANDOLPH COUNTY.

REPORT FOR 1861–64.

Randolph county has about an equal share of prairie and timbered lands within her limits, with a small amount of overflowed or swamp lands on the margin of the Okaw or Kaskaskia river. During the past four years the last of the prairie lands have been nearly all fenced up and put under cultivation. And, since the beginning of the last decade, the staple agricultural products of the county have been almost completely changed. Corn and pork raising, with considerable of cattle, and dairy products, were then the staple products of our farmers. Now, winter wheat has taken the place of corn, the ravages of the chinch bug, in many parts of the county, rendering the raising of a crop of corn the most precarious of pursuits; making it appear that farmers must either get rid of chinch bugs or altogether quit attempting to raise corn. The imports of corn into some parts of the county, of late years, to feed necessary farm stock, has been about equal to the amount shipped from it to other localities. Now, the more assured hope of

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raising a remunerative crop of winter wheat, with increased proximate market facilities for it, (there being about a dozen large merchant flouring mills, in the county, ten of these shipping to the amount of from 130,000 to 160,000 barrels of flour per annum), has caused farmers in this county to quit raising corn to a great extent. The fencing up of the prairies has also greatly circumscribed cattle raising and dairy produce.

During the past four years the raising of sheep and wool has increased over 100 per cent. in this county, but the number and depredations of worthless curs running at large are a sad drawback to raising improved breeds of sheep, and make the farmers who raise them, wonder that the dog law has not been extended down to this locality.

The raising of Sorghum or Imphee cane, for the manufacture of molasses, has also been increased from 200 to 300 per cent. during the past four years. No sugar has yet been made from the cane in this county, though the agricultural society of the county has offered large premiums for samples.

Flax, for the seed alone, continues to be raised to a considerable extent in the county; but it is not on the increase. Also, the Palma Christi, or Castor Oil Bean, is largely cultivated. Manufacturers say that from 30,000 to 40,000 bushels were raised in the county in 1864. Tobacco was also raised considerably the last four years, but it is not much on the increase.

More than twenty years ago cotton gins were common in, and cotton was shipped to a considerable extent, from the county; but its cultivation, except in patches for home use, had been abandoned, until the extreme high prices of cotton during the past four years caused our enterprising farmers to resume its cultivation on an extended scale. But the late reduction in price and the ravages of the worm that injured very much of it last year (1864) has caused a great decrease in the amount planted this spring.

Randolph county is rich in that most valuable mineral, coal. Its coal beds are excellent and extensive. Some mines have been worked for many years, but it is only in the last four or five years that a steadily increased shipment of it from Chester, (our county town) on the Mississippi, has been going on. The shipment of coal from that point might, and will be, greatly increased, by increased facilities for having it conveyed to the river, the nearest mine to which at present is fifteen miles, whence it is hauled in ox or horse wagons, over very indifferent roads. There are also great exertions making at present to strike both Petroleum and coal on the banks of the river, in the vicinity of Chester.

In connection with our county town, Chester, and our county coal trade, I may mention that while writing this, there is a gunboat lying there and surveying, with a view of locating a site for a Western navy yard.

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Randolph county has ever been Democratic, but her loyal population have given largely and freely of her sons for volunteers in defence of our Union and country. Yet, notwithstanding the large number who have gone into the army, the development of her resources and increased progress seem not to have been hindered, but stimulated, by this patriotic action of her gallant sons. May such ever be the fortune of those who do their duty. Onward and upward.

The Randolph County Agricultural Society, like the county itself, has been steadily and surely progressing, increasing its means and extending its usefulness and popularity. It is not like some other county agricultural societies, a joint stock business for the benefit of stockholders, but the grounds, buildings, etc., etc., are the *bona fide* property of the county agricultural society, of which any one may become a member, and have a vote and share in its management, by paying a small annual subscription. And its entire income, after paying necessary contingent expenses, is expended either in premiums or improvement of the grounds.

The grounds, a square of ten acres, adjoin the city of Sparta on the south, and have a substantial board fence eight feet high entirely around, with several frame buildings thereon, for exhibition purposes. They are beautifully located, and well supplied with shade trees. The scarcity of water on the grounds is the greatest drawback for stock. Several deep wells have been dug on the ground, without yet finding a spring, and water has to be collected in cisterns from the roofs of the buildings. There is also water, except in very dry seasons, in a small pond in a hollow corner of the grounds.

The following is a list of the officers and executive board of the society for the last four years, with a synopsis of the income and expenditures:

Officers for 1861:

President—Bryce Crawford.
Vice President—G. W. Stalley.
Executive Board—John Watson, S. L. Boyd, John A. Wilson, John Anderson, Henry Crawford.
Secretary and Treasurer—William Addison.

Receipts for 1861, $936 65. Paid expenses and premiums, $631 05.

Officers for 1862:

President—Bryce Crawford.
Vice President—Gavin Bichet

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The Executive Board, after advertising and making preparations for a fair in October, 1862, deemed it advisable, from the troubled state of the country generally, and our near proximity to unsettled districts in Missouri, to defer holding it.

Officers for 1863:

President—Henry Crawford.

Vice Presidents—Wm. Robertson and J. G. Jones.

Executive Board—John A. Wilson, Daniel McIntyre, Dr. T. Nelson, Samuel Burns, Gavin Bicket.

Secretary and Treasurer—William Addison.

Receipts, 1863, $1,544 35. Expenses, premiums, etc., $1,087.

Officers for 1864:

President—Henry Crawford.

Vice Presidents—H. B. Nesbet and S. W. McKelvie.

Executive Board—Wm. R. Brown, John Hodson, P. P. Gault, Daniel McIntyre, Bryce Crawford.

Secretary and Treasurer—William Addison.

Receipts, 1864, $2,051. Expenses and premiums, $1,542.

It may be mentioned that in the spring of 1864, in addition to the above expenditures, the Executive Board donated $200 to the United States Christian and Sanitary Commissions, and after their fair in the same year, $400 to the Christian Commission, by the Ladies' Aid Society of Sparta.

WILLIAM ADDISON.

SCHUYLER COUNTY.

REPORT for 1863.

My last report of the fair of the Schuyler County Agricultural Society was for the year 1860. The exhibitions for 1861 and 1862, were postponed, in consequence of the unsettled condition of the affairs of the country.

The society held their seventh annual exhibition, for 1863, on the 7th, 8th and 9th days of October; and, although the season was a very unfavorable one, the attendance and display was all that could be expected. The receipts exceeded the amount paid for premiums and expenses near two hundred dollars.

At the close of the proceedings, on the third day, the following named persons were unanimously elected officers of the society for the ensuing year, to-wit:

President—Simon Doyle.

Vice President—Jonathan D. Manlove.

Treasurer—Jas. L. Anderson.

Corresponding Secretary—Richard R. Randall.

Recording Secretary—Lewis D. Erwin.

Executive Committee—Wm. H. King, John A. Young, Geo. Baker, G. T. Whitson and Thos. Parrott, senior.

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The exhibition, this year, was a decided success, and confirms the Schuyler County Agricultural Society as one of the permanent institutions of the country. Already the society has raised, by subscription, near five hundred dollars, which will probably be increased to one thousand; which fund is to be expended in enlarging and otherwise improving their grounds.

LEWIS D. ERWIN.

STARK COUNTY.

REPORT FOR 1861–64.

The seventh annual fair of the Stark County Agricultural Society was held on the society's grounds, at Toulon, on the 25th, 26th and 27th days of September, 1861. Owing to the unfavorable weather, the attendance was not as large, nor the exhibition as good as formerly.

The proceeds of the fair amounted to	$615 05
Balance on hand from 1860	166 21
Total	$781 26
Paid for lumber, repairs, etc	335 95
Leaving a balance on hand, Oct. 12th, the time of holding the annual meeting of the society, of	$445 31

Which was paid out in premiums.

Officers for 1861:

President—W. W. Wright.
Vice President—Wm. Collins.
Secretary—S. S. Kaysbier.
Treasurer—O. Whitaker.
Board of Managers—S. P. Fast, Toulon; A. Schmuck, West Jersey; J. L. Hart, Goshen; B. F. Boughn, Valley; J. Funk, Elmira; L. Stone, Osceola; H. Shivers, Essex; James Holgate, Penn.

The eighth annual fair was held on the society's grounds on the 23d, 24th and 25th of September, 1862.

Proceeds of the fair	$850 50
Received from the State	100 00
Total	$950 50
Paid premiums and expenses	768 31
Balance on hand	$182 19

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Officers for 1862:

President—James Holgate.
Vice President—S. P. Fast.
Secretary—W. H. Butler.
Treasurer—O. Whitaker.
Board of Managers—G. W. Dewey, Toulon; J. H. Quinn, Goshen; N. Smith, Valley; J. M. Thomas, Essex; John Turnbull, Elmira; B. S. Foster, Osceola; W. King, Penn; A. Schmuck, West Jersey.

The ninth annual fair was appointed to be held on the 22d, 23d and 24th of September, 1863, but owing to the disturbed condition of the country it was decided by the board of managers to postpone it.

Officers same as for 1862.

The tenth annual fair was held on the grounds of the society, on the 28th, 29th and 30th days of September, 1864.

Proceeds of fair	$946 00
Balance from 1863	182 19
Total	$1,128 19
Paid in premiums, expenses, etc	$1,128 19

Officers for 1864:

President—J. H. Quinn.
Secretary—P. Nowlan.
Treasurer—O. Whitaker.
Board of Managers—A. P. Gill, Toulon; J. Nowlan, Goshen; J. L. Newman, West Jersey; Andrew Oliver, Elmira; John Lackey, Osceola; R. B. Carr, Penn; Prescott Blood, Valley; J. M. Thomas, Essex.

The exports of agricultural productions have been, wheat, rye, corn, oats, pork, beef, stock cattle and stock hogs. The amount of each cannot be given exact, as Stark county has no railroad running through it, and its products are taken to various points, viz: Galva, Kewanee and Neponset, on the Chicago, Burlington and Quincy Railroad; and Henry, Sparland and Chillicothe, on the Peoria Branch of the Rock Island Railroad, and Peoria, on the Illinois river. There has been a steady increase of the above productions during the past four years.

In consequence of the ravages of the chinch bug there will be quite a falling off of wheat the present year, and oats, corn and rye taking its place.

Winter wheat has been but little raised in this county during the past four years, in consequence of its winter killing, or rather freezing out.

Hog cholera prevailed in this county in 1861, 1862, 1863, taking off fully one half the hogs in the county; but in 1864, it began to

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disappear, and, at the present time, there are about as many hogs in the county as previous to the appearance of the cholera.

During the past two years, the cultivation of flax has attracted the attention of our farmers, and now some considerable quantities are being raised—some farmers putting in from fifty to sixty acres each.

Years ago, hemp was raised in this county, but it was abandoned, as an unprofitable crop, some ten years since.

In 1861, there were but few sheep in the county. At the present date, however, they may be numbered by the thousands. The exact number in the county I am not able to state at present. The sheep fever has prevailed quite extensively for the last two years, especially in regard to fine wooled sheep.

Tobacco has also attracted some attention, and several good crops have been raised within the past three years. One party told me that they raised twenty acres, from which they realized $5000.

Chinese and African sugar cane have become one of the common crops of the county, and seem to be on the increase. Nearly enough is raised to supply molasses for home consumption. The Chinese seems to take the preference for sirup.

In 1862, some sugar beets were raised in this county, but abandoned, as not paying the farmer, as labor was high and scarce.

Our county abounds in the finest bituminous coal; and, in 1861, but few mines were opened; now there are many, and quite a large business is doing in coal mining, supplying our own and part of adjacent counties.

Iron ore is abundant in our county, but has never been brought into notice.

The present year there are being a large number of new farms opened in this county.

The county, though small, is destined to be one of the finest in the State.

JAMES M. THOMAS.

ST. CLAIR COUNTY.

REPORT FOR 1861–64.

The fairs of this society have been regularly held: 1861, October 9, 10, 11; 1862, October 7, 8, 9, 10, 11; 1863, September 15, 16, 17, 18; 1864, September 6, 7, 8, 9; and all of them have been successful, though in 1861, when the fair grounds had been used as a camp for the 22d reg. Ill. vols., and again in 1862, many of the best friends of the society had doubted the expediency of holding the fairs, and they had been finally decided upon but a few weeks before the time. The heavy trial of bad weather, also, was successfully sustained in 1862; and it had the good result, that, in 1863, a

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hall was erected on the ground for the better protection of the many articles of ladies' industry, skill and taste. Another improvement, a great number of comfortable seats, were provided last year, by a section of an amphitheatre built round the ring, where fast trotting horses furnish a never flagging attraction to most visitors. This feature was, in 1862, introduced by sweepstake premiums, raised by a percentage on the premiums competed for, and for two years, also, by voluntary subscriptions. Such liberal donations we have had more than once gratefully to acknowledge; from the city of Belleville, in 1861, $100; from H. Whitmore & Co., of the Harrison mills, at Belleville, $100 in 1862, and $250 in 1863, for field crops of wheat; from H. Goedeking, $30, for the most useful and ingenious invention patented to a citizen of St. Clair county, which was awarded, in 1864, to Jacob Haege, of Shiloh, for his gang plow, centre stock plow and cultivator.

On the other side, the membership fee, which, in 1860, had been raised to $2, was two years afterwards again reduced to $1; but since 1863, it gives only to the members themselves free admission to the fairs, not to their families also, as formerly; and this change has not, as many expected, diminished the number of visitors on the ground, while it has so considerably swelled the receipts at the gates that this arrangement will undoubtedly be adhered to. Another change of the former rules, that of omitting the names of exhibitors from the cards attached to the articles, was, after a trial of two years, revoked. It was seen, that the partiality sometimes charged against awarding committees was more suspected than real, and that if it should take place in some instances, it might be exercised even without the names on the cards. To many exhibitors is the name on their card the only reward for their trouble in bringing their articles to the fair; a reward frequently as much coveted as the premium itself, when the judgment of the public differs from the award of the committee; for many, who want to sell the article, and particularly for those who manufacture it, it is the best advertisement. And all the visitors wish to know by whom the articles have been exhibited; and they, the greater number and as necessary for the success of the fairs as the competitors for premiums, are certainly as much to be gratified as the exhibitors.

The value of these annual gatherings becomes from year to year better understood; they furnish a welcome festival, and their influence on the improvement in stock raising, grain and fruit culture, and in so many other branches of human industry, is seen and felt throughout the county more than the exhibitions themselves may show. That these, perhaps, in some respects, may labor under a kind of sameness, is probably a complaint which other societies may have to make as well as ours, and might easily be obviated, if so many, from mistaken modesty or from love of ease, would not leave at home as good articles as those which are ex-

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hibited. Let us hope that when peace shall again bless our country, the pursuits of peace will be resumed with renewed vigor and energy.

Officers for 1861:

President—Benj. Scott.

Vice Presidents—W. J. McBride, E. W. West, Felix Scott, Jno. Knoebel, John Griffin.

Treasurer and Corresponding Secretary—S. B. Chandler.

Recording Secretary and Register—Anthony Schott.

General Superintendent—Joseph Penn.

Directors, from the Justices' Precincts—J. M. Casad, Jos. Hypes, F. Glaser, Phil. Rutherford, Ezra Blake, Thos. Winstanley, Einan Trotier, P. Dunn, Vit. Jarrott, C. T. Askins, Jos. Phillips, jr., J. C. Wilderman, Wm. Baumann, L. Darmstaetter, R. Dunlap, Penn. Ford, Max Scheel, J. Curtis, Jos. Ogle, F. H. Pieper, J. Ward, G. W. Stookey.

Officers for 1862:

President—Joseph Penn.

Vice Presidents—Jos. Hypes, Sam. Winn, Jos. Ogle, A. Stookey, senior, J. Weibel.

Treasurer and Corresponding Secretary—S. B. Chandler.

Recording Secretary and Register—A. Schott.

General Superintendent—R. A. Moore.

Directors—G. F. Lowe, Jer. Bennett, F. Glaser, Phil. Rutherford, L. Hite, Thos. Winstanley, Jos. Lepage, P. Dunn, B. C. Renoist, C. T. Askins, J. McCulley, J. C. Wilderman, L. Winter, Jeff. Rainey, O. E. Dewey, J. W. Middlecoff, P. H. Eisenmayer, N. Land, H. Goedeking, U. Atchison, F. H. Pieper, Aug. Chenot.

Officers for 1863:

President—Joseph Ogle.

Vice Presidents—Jos. Hypes, Felix Scott, H. White, A. Stookey, senior, A. C. Jones.

Treasurer and Corresponding Secretary—F. H. Pieper, in place of S. B. Chandler, resigned.

Recording Secretary and Register—A. Schott.

General Superintendent—H. Goedeking.

Directors—G. F. Lowe, Jer. Bennett, J. Salter, F. Glaser, W. E. Miller, H. Schweickhardt, B. C. Renoist, Jos. Lepage, P. Dunn, C. T. Askins, J. H. Lacey, Wm. Smith, Hor. Eyman, J. C. Wilderman, G. A. Seibert, Wm. Kraft, F. C. Horn, S. Dewey, Jeff. Rainey, Conr. Benner, J. W. Middlecoff, P. H. Eisenmayer,

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RECEIPTS.

	1861.	1862.	1863.	1864.
Contributions of members	$880 00	$871 00	$631 00	$740 00
Donations	100 00	424 50	362 35	557 80
Tickets sold at the gates	667 90	412 50	2139 80	2482 50
Entry fees	25 00	.....	.....	a 130 50
Assistants' tickets	.....	20 50	37 50	39 50
Booths on the fair grounds and outside	139 00	87 00	460 00	470 50
State appropriation	100 00	b 328 05	100 00	100 00
	$1611 90	$2143 55	$3730 65	$4520 80

EXPENDITURES.

	1861.	1862.	1863.	1864.
Putting fair grounds in order	$164 39	$147 76	c$1255 08	d$2610 74
Printing	141 55	170 50	208 40	226 45
Music	55 00	60 00	124 00	200 00
Society's premiums	707 94	877 00	829 00	710 00
Private and sweepstake premiums	.....	285 00	247 00	290 00
Ribbons, scarfs, etc	36 62	44 96	25 86	26 35
Register's office	44 00	66 00	66 25	134 00
Ticket office, gate keepers, police	94 25	125 80	151 60	255 00
Interest on debt	215 40	184 68	e 151 38	.....
	$1518 21	$1961 70	$2058 52	.....

	1861.	1862.	1863.	1864.
Amount of society's premiums offered	$1876 00	$1893 00	$1813 00	$1878 00
Amount of private and sweepstake premiums offered	.....	295 00	415 00	525 00
Number of entries of articles for exhibition	908 00	1024 00	874 00	699 00
Annual contribution of members	1 00	1 00	1 00	1 00

(*a.*) For sweepstake premiums. (*b.*) Including damages by camp. (*c.*) Including $1002 39, exhibition hall. (*d.*) Including $1398 57, amphitheatre. (*e.*) Including $20 85, fire insurance.

ANTHONY SCHOTT, *Recording Secretary.*

TAZEWELL COUNTY.

REPORT FOR 1861–64.

I herewith send you a condensed statement of the progress of our society during the years 1861, 1862, 1863 and 1864, as requested; also, a short statement of the early settlement of our county, with the first importations of blooded stock, and what our county has done towards perfecting farming implements.

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I cannot give you anything reliable respecting exports of agricultural productions, as a large share of said productions are sold by the producer in the markets of Peoria, Bloomington, Atlanta, and Lincoln.

Officers for 1861:

President—Josiah Sawyer, Tremont.
Vice President—G. W. Minier, Mackinaw.
Treasurer—J. L. Hayward, Morton.
Executive Committee—Joshua Brown, Dillon; David Eaton, Tremont; S. Scrivens, Groveland; L. P. Kingman, Tremont; Joel W. Clark, Morton; Edward Allen, Tremont; A. C. Dean, Tremont.
Secretary—Seth Talbot, jr., Tremont.

Receipts about $600; disbursements $600, including improvements.

Officers for 1862:

President—Josiah Sawyer, Tremont.
Vice President—G. W. Minier, Mackinaw.
Treasurer—J. L. Hayward, Morton.
Secretary—Seth Talbot, jr., Tremont.
Executive Committee—J. W. Robinson, Tremont; Solomon Puterbaugh, Mackinaw; Jerome Waltemire, Tremont; W. S. Maus, Pekin; A. C. Dean, Tremont; Hiram Franks, Groveland; Elias Wenger, Washington; E. T. Looney, Mackinaw; D. T. Sill, Morton.

On account of the disturbed state of the nation, state and county, by vote of the society, September 13th, 1862, the annual fair was postponed until the fall of 1863. No fair being held, the officers held over. The fair of 1863, held October 7th, 8th and 9th, proved more successful than any previous one, in amount of receipts, attendance and competition.

Officers for 1864:

President—Josiah Sawyer, Tremont.
Vice President—G. W. Minier, Mackinaw.
Treasurer—J. L. Hayward, Morton.
Secretary—Seth Talbot, jr., Tremont.
Executive Committee—Teis Smith, Pekin; A. C. Dean, Tremont; John March, Tremont; D. T. Sill, Morton; Lot Shurtliff, Groveland; J. Waltemire, Tremont; Edward Allen, Tremont; Wellington King, Pekin; Lester Pattee, Tremont.

The receipts for 1863, were about $700; disbursements for same period, about $700.

The managers have, from year to year, appropriated whatever the receipts exceeded the expenses in improvements. From the report of the census commissioner, to be made in October, the

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present year, (1865) a reliable statement could be made of the development of our county the past five years. I cannot, at this time, give you anything reliable that would do justice to the county.

There has been an increase in the production of flax; but, on account of the high price of labor, only to a limited extent.

The same may be said of cotton and tobacco.

The cultivation of sugar cane has increased four-fold. The production of wool has also increased very much. In the production of sugar cane the results have been very gratifying to the producers—our county having produced a large amount above what was required for home consumption.

The fair for 1864 was held September 28th, 29th and 30th. Receipts, including a small balance on hand, $900; disbursements including improvements, $804.

Great improvements are being made in the machinery and implements used for cultivating and harvesting crops, and in the mode of preparing the ground. Most of the corn is now planted by machines, Brown's corn planter taking the lead, and cultivated by cultivators, viz: Stout's, (patented by Isaac Stout, of Tremont township,)—Stafford's and Pratt's being the favorite ones in this locality.

The fair of 1864 was the largest ever held, although the weather was very unfavorable the first day. There is a growing interest in the subject of annual county fairs. There has been great improvement in all farming implements, within the past ten years, and I think our county fairs have been of great assistance in bringing about those improvements.

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In the fall of 1823, Nathan Dillon and family came to this county and settled near the Mackinaw river, on what is now known as the Tremont Prairie,—he being the first practical farmer who settled in this county. He was followed by several brothers in the spring of 1824. About the same time quite a number settled along the Illinois river, just below Peoria, on the east side of the river. Their names, so far as can be learned, were Croskey, Townsend, etc. In 1825, the Woodrows, Hawleys, Perkinses, Summers, etc., settled on what is called Sand Prairie. About the same time William Holland settled at or near the town of Washington, and was appointed by the government a sort of Indian agent, and gunsmith for the Indians in this region of country. These families were very kind and hospitable to those that settled here a few years later. From those families quite a large portion of our farming population sprung. The first public land sold in this county was October 27th, 1827. Immediately after this some additions to the population began to show themselves in various parts of the county. The deep snow began to fall in December, 1830, and continued at short intervals until the first of February, 1831

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when the fences were generally covered, and a greater portion of the wild game was destroyed by being covered with snow and perishing with hunger.

The county continued to increase slowly in population, but without any marked improvement in agriculture, until 1834, when the colony known as the Tremont colony, located their lands, in an almost geographical center of the county, in an open prairie, and immediately laid out the town of Tremont, and commenced building and improving the adjoining lands with great energy and perseverance, with improved implements of all kinds, together with almost every variety of fruits and vegetables, brought from all parts of the country. Still the implements of agriculture brought from the east were poorly adapted to the cultivation of the rich prairie soil; still that same class of implements continued to be used until 1837–38. In 1837, the first plow that would scour in all soils, was made in the town of Tremont, the pattern being brought from Sangamon county, where it had been in use one or two years. From 1838, they began to multiply in all parts of the State very rapidly.

In 1836, the agents of the Delevan colony selected their lands, in an open prairie, several miles from timber, and in the spring of 1837, began improving rapidly, with the same degree of enterprise and energy as the Tremont colony, three years earlier.

A few years later, Haines' Illinois Harvester, of Pekin, added very much to the interest and facilities of raising small grain in this county.

The first importation of blooded stock into this county, and in fact into central Illinois, was made by the late Col. Oakley, in the spring of 1840. They consisted of one full blooded Durham roan bull, two roan cows, and one full blooded stallion, of the celebrated Campbell stock; also, one full blooded mare, of the Bertram stock—both race horses; also, five Berkshire pigs, and a lot of long wooled Cotswold sheep. In 1843, Mr. Oakley again imported a lot of white pigs, called the Woborn stock, and a white Durham cow with calf, from another branch of the same breed—the most celebrated in England; also, a stallion, known in this and adjoining counties, as Sampson, imported by Boggs & Waite, of New York, a heavy draft horse. This horse was not a direct importation by Col. Oakley, still he is deserving of the credit of introducing him into this section of the country.

When this stock was brought here, very little was known in regard to its real worth to the county and State. The farm horses that have sprung from Sampson, have proved to be of great value. The other stock, after being kept a few years, became scattered about the country, at a great sacrifice to Mr. Oakley, and but little benefit to the State, from the fact that the people had not learned to appreciate the advantages bestowed upon them by a generous and praiseworthy gentleman.

SETH TALBOT, Jr.

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UNION COUNTY.

REPORT FOR 1863.

The South Pass Agricultural Society was organized in June, 1863. Has forty members; holds semi-monthly meetings, and is in a prosperous condition. The society has purchased grounds, and erected a hall worth $1200, is free from debt, and is accumulating a library of choice books. The officers are:

President—E. N. Clarke.
Corresponding Secretary—C. C. Wright.

VERMILION COUNTY.

REPORT FOR 1861–64.

Officers for 1861:

President—Col. John Gerrard.
Vice President—Dr. A. M. C. Hawes.
Recording Secretary—Lemuel Cross.
Corresponding Secretary—James Thompson.
Treasurer—John H. Goss.
Directors—David T. S. Jack, James M. Daugherty, John Macombson, Harvey Sandusky, Jas. S. Sconce, Francis Gaines, Jos. C. Smith, Col. Jesse Baldwin.

Although the whole country was in a state of the most intense excitement, and at times everything seemed entirely forgotten but to raise and equip soldiers to suppress the great rebellion, and to preserve our once happy and glorious Union from divisions and anarchy, yet when the time arrived for our annual fair, the farmer brought his stock and the products of his fields, the mechanic of his shop, and the matrons and the maids, who so recently had sent their sons, brothers and lovers to the field to defend their homes, their flag and their country's honor, now brought out the products of the kitchen, the garden, and innumerable articles of artistic skill, both useful and ornamental. The patriotism of all classes being incited, not only to defend their country, but to develop the natural resources of our own great State, increase its wealth, multiply and increase the sources of comfort and happiness to its rapidly increasing population, and to extend the blessings of Christian civilization.

Our people have not lost their zeal for the improvement of our domestic animals; nor their desire to improve the mode of cultivating the soil, and in their efforts they have been crowned with abundant success.

The great number of men which we have furnished to swell the ranks of our army, necessarily diminished the amount of stock and

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other articles exhibited at the fair; and, also, the number of contributors and visitors, which materially diminished the amount of money received by the treasurer. The quality of stock exhibited, however, was never surpassed at any fair held in the county.

The number of entries was eight hundred and sixty-five, of which one hundred and eighty were horses, twenty-three jacks and mules, fifty-five head of cattle, fifty-five sheep, and twenty-six hogs.

Of horses, in particular, our people claim to have a superior quality. Of thorough breds we have a number of the very best, and our farmers are zealously striving to improve the traveling qualities of common horses by an admixture of the blood of the turf horse.

Officers for 1862:

President—Jacob H. Oakwood.
Vice President—John Allen.
Recording Secretary—Lemuel Cross.
Corresponding Secretary—John B. Lee.
Treasurer—J. H. Gass.
Directors—Jos. C. Smith, James M. Daugherty, Benj. Hayworth, Joel Acree, C. L. Pate, H. H. Conover, Wm. Sandusky, James P. Felmley, Benj. Small.

At the time of our annual fair the citizens of the county were laboring almost night and day to organize the 125th reg. Ill. vols., seven companies of which were raised in Vermilion county. War meetings had been held almost daily for a month previous; farmers had neglected their stock as well as farm work; the military spirit had absorbed almost everything else. Many advised that the idea of holding a fair should be abandoned. The opinion was prevalent that a fair could not be held, that the minds of the people were wholly engrossed with the war, that an exhibition of the kind would be a complete failure. Yet our officers determined to persevere and do the best they could. The time arrived; the first day but few were in attendance, the second day the attendance was considerable, and a large amount of stock arrived; the third and fourth days there was a large attendance and a splendid show.

The amount of stock and other articles was about one-half as compared with our best fairs hitherto; but a better quality had never been exhibited in the county. Considering the circumstances under which our fair was held, it may be put down as a complete success.

Our society is now out of debt, has the confidence and good will of the people, and it is in a healthy and flourishing condition—its friends working zealously and harmoniously together.

The quality of our horses, cattle, hogs and sheep are being improved each year. The number of mules raised is largely on the increase. There has been a sufficient amount of sorghum raised

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to supply the people of the county. There will be a considerable quantity of tobacco planted this coming season.

Officers for 1864:

President—C. L. Pate.
Vice President—F. Gaines, Dallas.
Corresponding Secretary—O. S. Calvert.
Recording Secretary—G. W. Tilton, Catlin.
Treasurer—J. A. Church, Catlin.
Directors—P. S. Spencer, Danville; H. H. Conover, Wm. Sandusky, Dallas; B. Hayworth, Georgetown; James Daugherty, Fairmount; Geo. Fox, Conky's Store; G. N. Graves, Catlin; Wm. Rice, Ridge Farm; James Davis, Fairmount.

J. H. OAKWOOD.

WHITESIDE COUNTY.

REPORT FOR 1861–4.

Whiteside is essentially an agricultural county, for although it is intersected by Rock river, which furnishes abundant water power, it still lacks the capital and skill to make it what it is destined to become, a manufacturing county.

The exports of the principal agricultural products for the past four years, is found to be in round numbers, as follows:

Flour	320,000	barrels.
Wheat	1,500,000	bushels.
Corn	2,200,000	"
Oats	1,200,000	"
Barley	100,000	"
Potatoes	125,000	"
Onions	25,000	"
Live hogs	85,250	number.
Dead hogs	53,700	"
Cattle	22,000	"
Hides	750,000	pounds.
Tallow	120,000	"
Butter	2,340,000	"
Cheese	100,000	"
Eggs	6,000	barrels.
Wool	350,000	pounds.

The manufacture of agricultural implements has been carried on for the past two and one-half years, by Galt, Tracy & Co., and

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the same period, which has sent out machinery to the amount of $22,500. There have been about five thousand barrels of beer brewed, and $10,000 worth of leather tanned during the same period.

Some attention has been paid to the cultivation of sorghum and flax. There have been about 50,000 gallons of sirup manufactured annually for the past four years. The culture of flax the past season is estimated at three hundred acres, and the result of experiments thus far, has satisfied those engaged in its culture, that it will become one of the staples of the county, when skilled labor can be brought to its aid. Within the past year, one flax mill has been started, with capacity to dress the lint from five hundred acres per annum.

Lime and sand stone rock abound in sufficient quantities to meet the wants of the county. Bituminous stone coal has been found in small but not paying quantities. Peat is used to some extent as fuel, of which there are about one thousand acres, of an unknown depth. It is of good quality, and must, at no distant day, prove of great value.

Within the past four years, several additional flocks of sheep have been introduced into the county, mostly of the fine wools, and the number of sheep now in the county is about sixteen thousand. Much attention has been given within the same period to the improvement in the breeds of cattle and swine, and the result has proven highly beneficial.

A county fair was organized in the year, A. D., 1856, and has made annual exhibitions to the present time, with premiums offered varying from $2,000 to $3,000. The entries have averaged about one thousand annually, and, with the exception of the year 1862, the premium list has been paid in full.

WINNEBAGO COUNTY.

ADDRESS OF DR. JOHN A. KENNICOTT,

BEFORE THE WINNEBAGO COUNTY AGRICULTURAL SOCIETY, SEPTEMBER 19, 1861.

Gentlemen of the Winnebago County Agricultural Society, and Brother Farmers:

Speech making is a lever of words, by which politicians move masses of unreasoning men, and lift themselves into place and power. A man educated for a speaker, as are most of our public men, are rarely fit for anything else; and yet, you and I are here to sanction a custom that we ought to condemn. We have enough to see without listening to common place speeches. But as you have had the good sense to invite one of your own class and craft to address you, I shall give you a few facts and suggestions that no lawyer or politician would deem it safe to present.

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My theme is AGRICULTURE AND POLITICS; or HUSBANDMEN AND POLITICIANS. Every man who tills the earth, or rears domestic animals, is a husbandman; but politicians are *not* statesmen, nor often honest men, any more than a stumptail or counterfeit bank bill is the money it has passed for. Perhaps this is definition enough for the present.

Agriculture was the first occupation of man, and is still the first interest on earth! The only one that no civilized people, or great nationality can do without! The laws and rulers of primitive nations recognized and supported it; and every country on the globe has been steadily prosperous and powerful just in proportion to the success of its husbandry. These facts are all historical, in the old world, and rest on sufficient inferential data, and some undisputed history, in the new.

But as agriculture created wealth, and toil engaged its votaries, ruling families—rude politicians—in the shape of kings, feudal lords, priests, and conquering invaders came, like locusts, to devour the fruits of labor, and enslave the minds, and sometimes the bodies of laborers. All these evils of the dark ages the agriculture of the old world has survived; and great landholders and wise governments have so far improved it that an acre now often feeds more men than ten times the area less than a thousand years ago. Now, we should do the same here, instead of overrunning the whole land and skimming off the wonderful fertility of a virgin soil, leaving barrenness behind us; and we shall do it—when our politicians turn to statesmen, and the art and practice of agriculture are permitted to grow into a science and a profession.

And the time for this is at hand. Since the first politician beguiled Eve, in the Garden of Eden, and his progeny—"fallen angels"—came near upsetting heaven and earth (as ours are doing now) there never was a time when these bold, unscrupulous "sons of Satan" held such sway as they do now, and in this once happy country. And all precedent goes to prove that the culminating point is the turning point.

God gave the earlier politicians Kings to punish them; and those of Greece found their Philip and Alexander—Rome her Cæsars—while Christ came to deliver a believing world from the priestly politics of heathen ages. But who shall deliver us? Oh for a CROMWELL—*not a Napoleon*—to set this American people right, and save us from something worse than the Stuarts of his day! for God knows we need him; and HE, only, knows who is to be our "coming man"—or whether the scotched politicians of *1861*, (should we happily get the better of them now) may not return, like the Second Charles, or Louis Le Desire, to trouble us again.

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The first emigrants to the old United States of North America, were mainly of two very opposite classes, and impelled by widely different motives. And, perhaps unfortunately, they were set down at the two extremes of territory, then claimed by England—North and South—and to this day have remained separate, though nominally acting together, under one General Government. The first settlers, North, were of Puritan proclivities—a little too strongly tinctured with fanaticism, perhaps—but with all the solid virtues of the good old English middle classes, and an abiding leaven of the stern Cromwellian character and principle. Just the men to make republicans of, and raise up a nation of freemen—in the fear of God—the love of order and industry—and the great national creed of universal education and unlimited progress. The white men who peopled the South, were, on the contrary, "debauched cavaliers"—"broken gentlemen," or the "discarded serving men" of gentlemen—all thoroughly filled with the leaven of aristocracy—and, worse yet, for the truth must be told—to every gentleman of "good blood," there came over, or were *sent* over, ten turbulent subjects, desperadoes, and public criminals! For many years our Southern States were the Botany Bay of England, and the Texas of half ot Europe. And if the original strain of aristocratic "blood" still shows—the robber propensities of that larger infusion crop out more boldly, proving the stratum of audacious villainy that underlies "Souther chivalry."

But, for all this, the taint would have been "bred out" had it not been for the curse of Slavery, which has deepened and strengthened the natural arrogance and presumption of the Southern character, till the poorest "white trash" around the "plantations" (with less of letters than Northern children of seven years)—and the meanest transplanted "Yankee" who went there to sell clocks, and "married a plantation," really believe themselves to be great and chivalric personages! with hereditary rights and natural capacities for governing the North as properly as their masters rule the slave. And this feeling *we* have encouraged. For the sake of "trade," and a modicum of the "loaves and fishes" of the General Government, our Northern dough-faces have submitted us to the yoke, and, for half a century, left the South to dictate nearly every great measure, and to enjoy, to an unlimited extent, the power and patronage of Government. And the moment South-

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aid to agriculture; but nothing was done for the first and greatest interest of the nation! General Taylor did the same, with a like result! *Politicians* had pre-determined that aid to agriculture would be *death to them.* And they were right. For those who till the soil and *vote*, greatly outnumber all others, especially North; and, if well educated, and assisted in the way of their business, they would *know too much*, and have too much leisure for the good of their Southern and doughface rulers. Confining themselves to a few staples South, and performing all the work by human machines—needing no brains—Southern planters could well afford to educate themselves, for the sake of preventing all chance of Government aid in educating Northern farmers who *do their own work*, and are shrewdly suspected of *having* brains. Has it not been so? Is it not so now? A little "Desk" in the Patent Office, where a third class political "clerk" presides over a sort of "National Seed Store," is all the aid our Government has ever given to agriculture; and in but one instance, so far as I can recollect, has this clerk been selected with anything like reference to his agricultural aptitude or fitness. A $2,000 political clerk, in a basement room of the Patent Office, and paid out of the money taken from inventors, for all this great interest that feeds, clothes and supports every other! A $2,000 clerkship, representing a majority of all the people of the nation; and this in the face of the vast sums voted for commerce, which is but the outgrowth or factor of agriculture, and the immense "protection" given to manufactures, without reference to our own connection therewith, and the liberal millions squandered in a thousand ways, at home and abroad, for the support of government favorites and political supporters. Can you point me to a dollar ever expended for agriculture, North, that some politician has not caviled at? Even in this little agricultural seed store, or its annual catalogue called an "Agricultural Report," (the only good thing about it) the few cheap wood cuts, illustrating birds and quadrupeds, interesting to the farmer, were denounced by members of Congress! but without a word of censure on the colored plates of a South Carolina humbug strawberry, costing four times as much, and other Southern illustrated advertisements costing more. This I know for a fact; for during my only visit to Washington I got the figures and duplicates of the decried wood cuts—or rather duplicate electrotypes of a part of them, for use in our State Agricultural Transactions.

And right here, lest I forget it, I will name another fact, personal, learned at this visit. Outside of Congress, and in the Government, or its employ, I saw but one man in Washington! I mean a whole man—an honest, intelligent man—"the noblest work of God"—and that man was Joseph Holt, of Kentucky, then at the head of the Patent Office. I saw and heard the President and most of his Cabinet, and many other great politicians, but no "great and good man," save Joseph Holt. I believed this then, as we all know it now.

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The United States Government has done nothing for agriculture. When Congress passed a bill for agricultural education, Buchanan vetoed it! and that, too, after all his honeyed words and flattering assurances to the agricultural delegation, from all the States, that he well knew visited Washington to see this bill through the Senate. The truth is, the politicians fear agricultural education, and have been steadfast in the policy of ignoring our interests, always, and keeping us ignorant and divided, that they might rule us by wheedling us out of our votes, through political speeches, directed to the ear of the "clod-hopper," ("bone and sinew," when they want to flatter us,) instead of truthful argument presented to an educated understanding. And it has been nearly the same in State government—a few hundred, or at most, a few thousands, doled out to our county and State societies, is all the States have done for us—three or four partially endowed colleges excepted. And strong efforts have been made to retain these few "agricultural colleges" as *teachers* of *words*, and to make *talkers* instead of teaching farmers "the things next to them," and making educated MEN of the sons of the farm. And in many of our agricultural societies the political element preponderates, to the injury of agriculture, as well as the disgust of true agriculturists.

There were never yet, *ten* true, unadulterated farmers in Congress! and, except, perhaps, in Massachusetts, and possibly two or three other States, more than that number in any State Legislature. *Nominal* "farmers" there are, in every Legislature, and we have even had a President or two *called* "farmers"—*the last, him of Wheatland!*— but all were either successful generals, or successful politicians—some of them STATESMEN—the "generals," especially. Would we had more of *them*. And we *may* have, after the war. A war, which politics and politicians have got us into, and which the good God may yet direct to *their* destruction. *That* is *my* great hope—even though politicians instead of soldiers, lead our armies, and *Pierces* and *Hurlbuts* are made brigadiers over such heroes as WINTHROP and SLEMMER. War is a great leveller—bearing down cowardly cunning and political strategy, and uprearing brave and modest ability and "CONDUCT." And, God, directing, this war may yet do for *us*, what Cromwell and his confreres and successors did for England. And, (perhaps *without* the guillotine) what its revolution and two Napoleons have done for France.

But, I say, better "hemp" and the platoon than *rebellion* as it is, or our *politicians* as they were, and, to a great extent, still are. If we can get shut of *it* and *them*, at the expense of one thousand

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slavery—of both the white and black race—in North America. The black is enslaved by force of "law"—the white by force of CUSTOM and sheer political trickery. The one is fed and clothed for *his* labor, but has *no rights that a white man is bound to respect.* WE have food and clothing, and many "lawful rights," besides personal liberty, and the right to select our masters; and yet we, like the African slave, labor for their support, and are almost always tricked out of the right of selecting those who govern us. By "caucus" and "convention" trickery, and the flattery of *words*, we are *compelled to vote* for such politicians or "available candidates" of a party as are selected *for* us, or throw our vote away! Now and then, it is true, public opinion points to THE MAN, and the politicians take him, and keep him; but once in their power, if naturally honest, *he cannot remain so.* There is something in the atmosphere of politics and *power* that upsets everything like moral honesty, and substitutes therefor "political expediency," and party and personal aggrandizement. So it has been since the days of WASHINGTON—our only no-party President—down to "honest Abe"—whom may God keep honest, and with him *end the race of party Presidents.* And it now looks a little like it; for he is "head and shoulders" above the tricksters who gave us the opportunity to elect him—and in the great work of re-construction, which he *knows* he has to do, he may help to wipe out the bad combinations, which I believe he deprecates, as we do—some of his brigadier "appointments," and lawyer-like scruples, to the contrary, notwithstanding.

And yet we cannot, with all our respect for the President of these United States—and his proverbial honesty of purpose—disguise the fact that our Government is still one of politicians and lawyers, not statesmen. There seems to be a wonderful fear of hurting the rebels—and especially of touching their great "domestic institutions"—that may yet require an Ironsides or a Napoleon to set right. And better him, than a war without an object—and far better make "root and branch" work of it now, than have it all over again, as we must have, if the causes and creators of the present war are not "wiped out" with it.

The producing interests of the North—and chiefly agriculture—must furnish the fighting men, and pay the bills; and is it not about time we began to inquire how our men and money are employed? And why, when "we are in the midst of a revolution," earnest and bloody, the laws of war are not made to supersede all others while the war lasts?

We—the producing classes of the nation—are those who should make, and unmake governments and laws; and while we support what exists, it is our right and our duty to inquire into the operations of both.

When a people is worthy, God raises a leader—the occasion the man. FREMONT and MCCLELLAN—"PATHFINDER" and young

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"CAPTAIN"—men of the people—men for the times—who know *what to do*, and how to *do it*—to YOU we look to cut this political knot, with the sword; and, if need be, (which God forbid) to "take the responsibility!" with only a Jacksonian regard for slow-moving "precedent" and time-honored "rank."

WOODFORD COUNTY.

Officers for 1862:

President—O. A. Burgess.
Vice President—Charles Rich.
Treasurer—J. W. Page.
Secretary—I. J. Marsh.
Directors—O. A. Burgess, Charles Rich, Jesse Hammers, John J. Perry, George Ray.

COLES COUNTY.

REPORT FOR 1861–64.

Statement of Produce Shipped from Charleston, for the years 1861, 1862, 1863 *and* 1864.

	1861.	1862.	1863.	1864.	Total.
Number of hogs	2342	10,034	9725	6065	28,175
Number of sheep	117	450	100	920	1587
Number of cattle	122	723	836	650	2331
Number of horses	222	667	343	84	1316
Number of mules	.....	117	28	36	181
Tons of hay	29	351	137	255	772
Bushels of corn	17,340	11,260	9030	19,700	57,330
Bushels of wheat	22,620	49,475	9275	30,975	72,375
Bushels of rye	760	350	200	350	1660
Bushels of timothy and flaxseed	60	680	250	680	1670
Pounds of bulk meat	5990	20,000	45,200	83,870	155,060
Number of barrels of flour	3658	5003	5039	3944	17,644
Number of barrels of beer	96	78	53	37	264
Number of dry hides	1208	1470	2546	1957	7181
Bushels of oats	3350	1800	2300	11,900	19,350
Bushels of potatoes	330	3000	400	100	3830
Bushels of barley	300	.....	150	450	900

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Inclosed please find statement of the produce sold in this market during the last four years. You may rely on this being correct, being made up by the railroad agent, H. W. Hibbard, from actual figures:

SIMEON W. TRUE.

Statement of Agricultural Products, Stock, etc., Shipped from Mattoon Station, in the years 1861, 1862, 1863 *and* 1864.

	1861.	1862.	1863.	1864.	Total.
Bushels of corn.....	188,010	607,720	144,440	112,140	1,052,310
Bushels of wheat.....	60,510	139,200	50,050	85,030	334,790
Bushels of rye.....	600	1000	350	300	2250
Bushels of oats.....	2288	132,350	8000	30,500	173,138
Number of cattle.....	2304	3504	2870	4530	13,208
Number of horses.....	168	850	2326	2201	5545
Number of mules.....	340	660	451	462	1913
Number of hogs.....	12,240	12,025	12,520	4520	41,305
Number of sheep.....	1000	840	570	100	2510
Pounds of pork.....	703,535	1,251,214	584,665	51,900	2,591,314
Pounds of lard.....	5865	182,111	69,840	4404	252,220
Pounds of tobacco... .	.....	.....	....	15,680	15,680
Bushels of potatoes....	.....	643	322	1173	2138
Tons of hay.....	45	217	15,425	2400	18,087
Pounds of vegetables...	.....	.....	33,300	.....	33,300

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PREMIUM ESSAYS.

ON THE CULTIVATION OF FIELD CROPS AND PREPARATION OF SOILS.

By J B. Turner, of Jacksonville, Illinois.

It can hardly have escaped the notice of intelligent practical men that our popular philosophy of agricultural growth and production is entirely too meagre and narrow, and that the cultivation based upon it must therefore fail of its proposed ends. Hence we find men who know nothing of books and theories oftentimes succeeding far better than those who know much of them; not because books are useless, but because the present theories of our books are too narrow and incomplete; they do not take into full view all, even of the essential facts in the case.

The first question is, why does plowing or cultivation of any sort tend to enrich the soil or increase the crop? What is there in the mere stirring of the soil that should produce such marked and well known results in fact? The popular idea is that it simply mixes together the ingredients already in the soil, and presents them more readily to the rootlets of the plants within the area of the ground so plowed or stirred. Nothing could be more illusory and false, for we need only to consider that more than nine-tenths of every plant grown, comes in fact out of the atmosphere, and not originally out of the earth at all, and that the roots of wheat have been known to extend downwards five feet, and those of corn ten feet, in order to see that any possible mere scratching of the surface with plows and harrows could do but little good, if that were all, or even the chief part of the benefit to be derived from it.

The real end in plowing, therefore, (aside from the mere destruction of noxious weeds, which is purely mechanical,) is to put the soil in such a condition that it may most readily and continuously absorb from the sun and the atmosphere above, the heat, moisture and other atmospheric elements, of which more than nine-tenths of all plants are composed, at the same time that it most readily absorbs or draws up from the depths of the subsoil below, by cap-

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illary attraction the remaining mineral ingredients of which the other one-tenth of vegetation consists. We therefore really plow about ten times as much with reference to the heat and the air, when we plow wisely and successfully, as we do with reference to either the soil or subsoil. To show the supreme and all-controlling importance of heat alone, in this process, we need only consider the difference of the same soil in productiveness here and in Greenland, or under the Equator. To show the importance of due degrees of moisture, neither more nor less, we need only compare swamps, sandy deserts and arable lands, lying in the same latitudes. To show the importance of ammonia and carbonic acid, and other ingredients absorbed from the air, we need only consider the difference between a piece of ground thoroughly pulverized, and prepared for the highest degree of absorption from the air, and the same ground trodden hard or even glazed over at its surface.

These and similar considerations must convince every reflecting mind that *heat*, *moisture* and *atmospheric absorption* from above, connected with *capillary absorption* or *attraction*, from the subsoil below, are, after all, the great ends in plowing and cultivation, and not the mere preparation and mixing of the ingredients in that small portion of the soil which it is possible to stir with the plow.

There is no plant cultivated whose roots, in a good soil, do not extend entirely below where the plow ever runs; and many of them derive a greater part of their earthy nutriment from below that point; and if the productiveness of the soil was actually limited to that narrow range which the plow stirs, probably three years' cultivation would exhaust the richest soil on earth; whereas, some soils have been known to produce successive crops of grain for hundreds, or even thousands of years, without any manure whatever—as, for example, those soils about Naples.

It has been supposed that the lime and other earthy ingredients in the soil became exhausted by successive croppings, and that for want of these the soil was rendered unproductive. This may be true in some cases; but there is no reason to suppose that these earthy ingredients, in our richest common soils would become exhausted in thousands of years, under any rational system of culture, even if cropped year after year. God did not make the world to wear out or run down in three or five years; and as there is a great system of *aqueous* circulation which dips the water up out of the ocean and pours it, in rain and dew, upon the lands again, to keep up a perpetual supply of moisture, so there is also a great system of conjoint *atmospheric* and *terrestrial circulation*, which constantly replenishes the supply of all other materials on good soils, needful for vegetable growth, whenever and wherever man puts the *surface soil* under conditions favorable to their absorption and action. So that, not simply the bare clods which he moves, work with the good plowman who cultivates according to the laws of nature, but the sun, the ocean, the winds, the storms, the light and

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the darkness, the heat and the cold, the air with all its currents and gases above, and the earth with all its fluids and treasures beneath—all together and alike conspire and co-operate with him who works according to these inexorable laws, and against him who does not; and if the skillful plowman's plow-share does not literally move the world, still the whole world literally moves, to co-operate in the ends which it seeks to accomplish. On the contrary, it is hard for a man to spend his whole life in fighting this law of universal nature, with his bare plow-share, whether he does it according to the rules of the books, or according to the rules of his grandfather.

What, then, are these three great systems of circulation, the *aqueous*, the *terrestrial* and the *atmospheric* or *gaseous*, by which the exhausted soil is constantly re-supplied with all the *watery*, *earthy* and *gaseous* matter needful to its re-production?

When we reflect that more than two-thirds of the whole earth's surface is covered with water, and that more than half the solid globe, earth, ocean, air and all, is made up of those very elements or materials which produce all possible vegetable and animal growth, we need not be in any very great fear after all, that our watering pot will become empty, or our manure heap exhausted, if we only learn the art of applying them to their proper ends and uses.

The great system of *aqueous* circulation which supplies vegetation with water, through rains, fogs, clouds and dews, from the ocean to the land, and by the rivers and streams pours it back to the ocean again, is sufficiently well known, in its general outlines, to all, and needs no further remark here.

But the great systems of *atmospheric* and *terrestrial undulation*, or oscillation, so to speak, and their incessant co-operation and interplay upon the surface soil of the globe, the one ministering to the absorption by the earth of those gases from above, out of which nine-tenths of all vegetable structures are composed, and the other supplying from beneath, by capillary attraction, the earthy matters in solution, out of which the remaining tenth part is made, have never been as fully investigated and understood.

In describing them I shall pretend to no scientific accuracy, (for the present state of our knowledge hardly admits of it,) but only give my general impressions with reference to the present end in view.

I. The atmosphere above is in a constant undulation or oscillation, or alternate rise and fall, produced by the heated air at the surface, constantly rising, while the cooler air above descends to take its place below; thus, as if by one everlasting series of kisses, it is constantly imparting to every square foot of the earth's surface, for its absorption, all the gaseous matter that it may contain, and which the soil may need or be prepared to absorb. Its lateral or spiral motions over and around the earth, in the form of winds, conspire also, to the same grand result.

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These winds, in their regular circuits, as all know, sweep spirally and uniformly round the whole globe, coursing incessantly and alternately over every zone, frozen or burning, every continent, every mountain hight, every ocean and every sea, in their great regular and periodical circuits, aside from the varied dancings with which they thread their mystic mazes around every storm cloud, and every accidental or local disturbance at the surface of the earth. These great horizontal periodical sweeps or circuits of the whole atmosphere, and their attendant local dancings, united with its periodical tremor or oscillation up and down, as it goes, referred to above, exactly fit the whole atmosphere to perform its special functions to agriculture, as the great *universal scavenger*, *irrigator* and *fructifyer* of the globe; to gather up from earth and sea all needful waste organized matter, where it is not needed, and deposit it again on lands where it is needed; thus throwing it anew into the hopper of the great mill that is perpetually grinding out all forms of organized life.

Thus, by this simple and beautiful arrangement, when there is an excess of moisture, or any form of gas in any portion of the earth, the air licks it up and bears it on to some other place; but if the excess is in the air, it as readily imparts it to the earth in the form of dew by night, and absorbed vapors and gases by day. These materials, which, as we have said, in themselves constitute more than nine-tenths of all vegetable growths, are gathered up by the air, the whole world around, in all possible sewers and manure pits, as well as from all continents, islands, oceans and seas, and they are not likely to be exhausted.

I cannot help pausing here to say, that by a most wonderful arrangement as regards the specific gravity of water, the denser waters of the ocean are piled into ridges about the poles, which by a perpetual avalanche, or water slide of the sea, throws the warm water to the north, thus producing there an open sea, even at the poles, while it presses the colder water, with their monstrous icebergs and ice islands, to the south; thus not only equalizing all climates in respect to heat and cold, as far as possible, but setting the whole ocean itself, from its lowest depths, into a perpetual whirl of currents and counter-currents, similar to that of the air

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sweep every zone, and every nook and corner of the earth, but the very bottom of the sea, in quest of whatever is useless or injurious to animal life there, to suborn it again to the service of man and beast upon the land; for the peculiar oscillating and depositing motions of the atmosphere, of which we have spoken, cease upon the sea, and occur only upon the land; it, therefore, only gathers upon the sea, and deposits upon the land, wherever the land is prepared to receive it.

The corresponding action on the part of the earth, known in its main features as *capillary attraction*, everywhere responds to this action of the air above; and whenever the surface soil is in a condition to facilitate the action of the one, the other is incited to action equally vigorous and prompt, and thus, this capillary attraction brings from below the remaining one-tenth of the vegetable food needed, just in proportion as nine-tenths are supplied from the air above, all other things being equal.

There is also, doubtless, what may be called a lateral capillary attraction in the soil, by which the food of all sorts is conveyed from all sides directly to the mouths of the little rootlets of the plants.

The main object of cultivation is, therefore, self-evident. It is to keep the *soil at all times* on the surface, in the best possible condition for the *absorption* of *heat*, *moisture*, and the *atmospheric food* of *plants*, from above, and for the free attraction of their *earthy constituents* from the depths below.

In other words, it is to take due and constant advantage of those simple but magnificent provisions which nature has made, constantly to replenish the earth with the *heat*, *moisture*, *gases* and *fluids* indispensable to all vegetable growth, from the sun and the air above, and from the ocean and earth beneath.

This whole process of absorption and attraction resembles in its most material aspects the burning of a lamp, and may well be illustrated by it. In short, it is in itself a great burning of the earth; one part of that great everlasting combustion, by which all the processes of nature are continually carried on.

Now, in the case of the lamp, the process is set in motion and carried on by the burning, as we call it, in the air above; that is, the air is constantly circulating around the wick, and bringing its gases into near and intimate combination with it, and the oil it contains, just as it circulates around and over the surface of the earth; and by a capillary attraction thus induced, the oil is drawn up from below as the liquids are in the earth by a similar cause. Now, if your lamp wick is too hard twisted, or too slack twisted, or too coarse in its texture, or too fine and compact, or too much glazed over at the top; or if a wire or tight thread be tied around it below, so as to stop the passage of the oil upward, the burning will be impeded, or the lamp will go out, and the whole process will altogether stop; and neither the burning above, nor the attrac-

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tion below can go on successfully, except when all parts of the wick that are above the oil are just right: this everybody knows. Now, what the top part of the wick is to the whole lamp and its oil, the plowed surface is to the whole field below, at least so far as all needful purposes of illustration are concerned. With this familiar simile in view, therefore, we can now intelligently search out the main defects in our common modes of plowing, and of cultivation.

They all, of course, relate to that upper portion of the field which is actually moved by the plow, and which may be defective either at its upper or under surface, or in its whole interior mass; just as our lamp wick may be too much glazed at the top, or tied with a tight string at the bottom, or too coarse or hard, or fine and compact throughout; so in our plowing and cultivating, we may leave the upper surface too much glazed, too smooth, or too rough; or the bottom surface too hard and compact; or the whole mass too coarse or too hard, too loose or too fine, too shallow or too deep.

I. *First, the upper surface may be too smooth or too rough.* Where ground has been suffered to lie too long, especially after a heavy rain, in clay soils like those in the west, the surface becomes *glazed* or *crusted* over with a sort of smooth glassy crust, of a considerably lighter color than the same soil is when not so glazed, and sometimes almost of a pale grayish white, even in soils generally quite dark.

Now, this crusting over of the soil, as all well know, interferes at once with the processes of successful growth, but the reason why it does is not generally considered.

But we shall find that it lies in three of the most vital points: every one of which tends directly and seriously to retard all vegetable growth, especially of such plants as *Indian corn*, and others requiring great heat in the soil.

1. In the first place, this glazed surface being of lighter color, has far less power on that account of absorbing the rays of the sun than it would otherwise have, while the glassy surface constantly, from its smoothness, reflects back the rays like a mirror, and from these combined causes a vast amount of the first element of rapid growth, namely, *heat*, is daily and hourly dissipated, or thrown back into the air and wasted, instead of being absorbed into the soil.

2. In the second place, this smooth surface *excludes* the *free access* of the *air* to the interior of the soil, into which it would, from the undulatory or vibratory motion, (which I have described) otherwise penetrate, and, (by making a constant deposit of dew among its loose particles, both by night and by day, together with the ammonia and carbon, or whatever else contributes to vegetation,) thus perform its proper functions toward growth, all of which by this little crust are more or less interrupted.

3. But by thus shutting out the free access of both heat and air from above, the corresponding interplay of capillary attraction from

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below, is also interrupted; just as when the lamp wick becomes glazed over, the lamp not only ceases to burn brightly above, but the oil, in like manner also ceases to respond, and to run up from below, so that by this simple glazing of the surface of the soil, every one of the three great essentials of each of these circulatory systems, and of all successful growth is at once checked or retarded, and the entire root of the plant becomes robbed of every one of its elements of life, namely, the heat of the sun, and the gases and moisture which supply its growth from the atmosphere above, and the capillary attraction which supplies, when needed, its moisture and all other needed elements from below; the mischief is, therefore, vital at every point, and its real effects any one can see by simply keeping this crust broken every day with a hoe, on one row of cabbages or other plants in a garden, and allowing another to stand glazed over week after week.

For the same reason it is injurious to ground to lie in the sun thus glazed over, whether there is any crop on it or not—that is, it will grow no better; it gains nothing, or but little, either from above or below, whereas, if the surface was roughened with a harrow, or even covered with boards or with weeds, alive or dead, so that it need not crust over, it would be constantly enriching itself, both from what it received from the air above and from the subsoil below. Hence when a long drought succeeds a heavy rain, naked fallow plowing may do more hurt than good; that is, the soil may not gain as much, either from above or below, when so crusted over, as it would have done if it had been let alone, and not fallow plowed at all. The proper remedy, of course, in all such cases alike, is simply to break up this crust, as often as it appears, either with a hoe or harrow or cultivator, or whatever is convenient. In other words if your agricultural lampwick gets glazed over, the only thing is to SNUFF IT—with your fingers, or whatever you can get hold of—for it cannot burn clear again till you do; unless indeed Providence should see fit to undertake your own proper work for you, and send along a thunder-storm to snuff it for you; which He will not always do in season, for it is not His business to snuff your candles or hoe your cabbages for you, though He may possibly do it. Better do it yourself. Attend to your business, and He will attend to His first rate—be assured of that; and on ground liable to crust or glaze over, it is your business to plow and stir OFTEN, even though it may not be very deep, and some seasons much oftener than others; and the man who has concluded to cultivate just so many times every year and no more, let the weather be what it will, ought also to conclude to wear just so many jackets every day, summer and winter.

4. But, on the opposite extreme, the upper surface may be TOO ROUGH. In this case there is the same or even a greater loss of heat, especially in the spring, than before, while all the other processes are interrupted from an opposite cause. The sun's rays are

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caught in great clods by day and blown away by night, while the interior heat of the earth is fearfully wasted by the more rapid radiation from the rough uneven surfaces. All are aware how the light snow will melt sometimes from a smooth or rolled field in a single day, while it remains for weeks on an adjacent uneven or cloddy field. This shows us how much heat is wasted by leaving the field rough and full of clods, in the spring months, which would otherwise be absorbed into the soil and laid up to push the young corn into an early maturity of growth. For the best manure heap any corn-raiser has is the SUN, the next best the AIR with its GASES, and the rest he may find in his field below, or in his farm-yard, or wherever he pleases; but if he so cultivates as to constantly waste the power of the SUN and the AIR, he cannot raise a first rate crop of corn, manure it as he will. Since our spring climate usually has too little heat for corn and too much for wheat, we should keep CORN surfaces smooth, so as to save as much heat as possible, and WHEAT surfaces rough or ridged, so as to avoid it as much as possible. So, in all cases, we save heat by smooth surfaces, if they are not glazed or glassy—and dissipate it rapidly by rough ones; both that which comes from the sun above and from the center of the earth below. Water also stands and lodges upon rough, cloddy surfaces, and thus again dissipates, in its evaporation, an immense amount of this vital element of the corn crop, for it wastes the same amount of heat to boil away or evaporate a quart of water in the field that it does in a kettle over the fire. Such rough surfaces also retard the deposit of moisture and gases from the air above, and to the same extent interfere with the capillary attraction from below, much as too much frizzling the top of the lampwick arrests all its proper modes of burning. The free and proper access of the air to the soil below is everywhere interrupted by dry clods and inequalities, which it cannot penetrate, or if so only to have its deposits blown away again by the winds; and, while the natural action is thus interfered with at the surface, that from below must be correspondingly impeded, and the whole process, either of recuperation or growth, in like manner retarded.

II. The *whole mass* of earth, stirred by the plow may be *too deep* or *too shallow*, *too coarse* or *too loose*, *too soft* or *too hard*.

This whole mass of earth, thus stirred by the plow, effects two ends:

First—It furnishes a proper prepared nidus for the rootlets of young plants to run in and seek their food, while the plant is still young and tender, and its roots extend but a short distance from their starting point.

Second—It increases the absorptions and attractions from the air above, and from the sub-soil below, as already explained.

The importance of a proper *nidus* for the tender roots of the young plant, will more clearly appear, if we consider that the inherent power of the root increases nearly as the square of its dis-

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tance from the center, and not simply as the distance; hence, when a young root has extended outward in all directions twelve inches, it has an inherent power represented by 144, while its inherent power when extended only two inches, is represented only by four. The importance, therefore, of a well prepared nidus, and of frequent and close cultivation near the roots of all young plants, in order to help them, and nurse them in their start, is well represented by the instinctive care of the mother bird for her young ones, or the care with which you hold your hand before the lamp just lighted, lest the flickering flame should go out; and more can ordinarily be done for a corn crop before it is six inches high than ever can be done afterwards. So far as this nidus is concerned, it should be remarked that all uncrushed clods or hard lumps of earth, even if not bigger than a pea, are of no more use to the roots of a young plant than so many gravel stones. They cannot penetrate them or do anything with them; for a young and tender root can neither grow in these clods or lumps, nor in the vacant air-holes around them; the consequence is that the rootlets start to grow in one direction and meet a clod at which they must stop, and take time to make an offset and shoot off in some other direction to avoid it; there again they soon meet an air-hole or another clod, and must again haul up and start anew. Thus the struggling rootlets are balked and repulsed on all sides, turning hither and thither, as freezing birds turn over in a cold nest, stretching up their bills in vain for food, till many precious hours of the early spring are past, before they can get any proper hold of the soil around them; go along now and crush these little clods and their attendant air-holes altogether, into a fine and suitable mass, and you do two most important things for the roots themselves; you liberate to their free use all the rich nutriment that is bound up in those little clods, and you enable the tender rootlets to shoot out straight through them in all directions, without these incessant delays and offsets; and I have frequently seen even one such culture change the whole size and look of a row of young corn in a single week, so that it could be seen all over the field, and appeared in contrast with the rest as though it had been heavily manured, which, indeed, was really the fact, for what difference does it make to the young grain whether you cart on *ten* loads of manure upon your field from abroad, or crush up and liberate, and put to its proper uses, *twenty* loads that are already there, at the same time that you take these other obstacles to the young roots out of their way.

Second—But this effect of the proper fineness of the mass of the plowed soil, by crushing or otherwise, great as it evidently is, is not its only effect. It also increases and facilitates in an equal degree all those absorptions from the air above, and those attractions from the sub-soil below, of which we have spoken above; and thus again sets all those vast circuits and economies of the sun, the earth, the ocean and the air into harmonious co-operation with the rejoicing farmer and his triumphant plow.

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The mass of earth thus stirred may be too *deep* or too *shallow*. In soils like our rich black prairies, which abound in *humus*, which has a great absorbing power, if the farmer wishes to raise wheat or oats, if he plows or stirs it too deeply, he will so increase its absorbent and prolific power that his wheat or oats will all run to straw, as they say; that is, they will grow too large in the fore part of the season, and fall down and blight before the time of ripening. So, everywhere in nature, we may have too much of a good thing; too much learning has made many a man mad, though it did not make Paul so; and thus too much or too deep plowing will sometimes defeat the end of all plowing. God presupposes that every man will have common sense, and adjust all his methods and all his processes to the particular end he has in view, or the particular crop, and the particular soil he has to cultivate. Hence, when a man on our barrens writes or says that deep plowing is the best in all cases, even for wheat and oats, the man on the prairie need not run mad, and stick his plow in up to the beam in all cases, because his neighbor has found it good to do so. Let every writer tell us what his location is, his county first, and what his soil is second; and then we can judge whether it is proper for us to follow his methods or not, and let him know that if he writes the sky over, he can give us no practical information for our use till he does that. Some soils need to be plowed to the beam all the time; others need it for some crops, not for other crops, and some few do not need it at all, their natural absorbent power will produce as great a crop as can grow and stand upright in the field, and that is enough; and what use is sweltering both man and beast to do work to no profitable end, except some one in the newspapers has told us that he does so and so. Where does *he* live? and what is *his* soil? These, and these alone, are the vital questions to us, and perhaps the only questions whose answers he withholds. It is wisely ordered that every man shall be compelled to study his own particular farm, and not take on trust all his neighbors say.

Great and *eternal principles* affect us all alike; their wise application can belong only to the particular man. It is therefore wisely ordered that the intellect of the race combined should search out the one, and that on him alone should be thrown the responsibility of the other.

The depth to which any man should plow for any particular crop can be determined wisely only by himself. To revert to our standing simile: the depth of plowing is analogous to the hight of the wick in the lamp. If a man, then, wants more light, let him raise the wick of his lamp, so that the flame will take hold of it deeper down; and if he wants less, let him make it more shallow. So if he wants a greater bulk of crop in any one case, let him plow deep; or if he wants a less bulk, let him plow shallow, and according as he adjusts his wick in the field with his plowshare, all other things being equal, so will the flame of his crop be either light or heavy; and the fineness of the wick of the lamp is of more vital importance than the

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mere depth to which it is made to burn, so there can be no question that the same *fineness* is of more consequence than bare depth of plowing in the soil.

It may be laid down, then, as a universal principle, that no soil can be crushed too fine within a given depth for any crop whatever, while it is usually left far too coarse for all crops. The importance of this simple element of comminution or fineness will appear if we consider that there are soils of very fine sand in Ohio which bear splendid crops of corn annually, which are, by chemical analysis, exactly similar to other soils of coarser sand in the East, which will hardly bear anything at all; and precisely the same chemical ingredients which compose our present prairie soils may be found everywhere on rocky mountain hights, which will produce nothing but the bare mosses. And still further, I have seen old fields in Morgan county, which had been wadded up with simple steel plows and the yearly tramping of teams and horses into clods and balls of earth till they would not, under the same culture, produce forty bushels of corn per acre, and were thought to be worn out, but by making the soil fine and deep again, they produced, by actual measure by the State Board of Agriculture, from one hundred —even to one hundred and thirty bushels per acre. All are aware of the successful experiments of Jethro Tull, and others, in England, who inferred that a due degree of pulverization of the soil by plows, harrows and rollers, was all that was needed to secure its perpetual fertility in the same crop year after year. And in some soils, like those around Naples, and like many of our soils in Illinois, where there is a rich, deep subsoil, this theory would prove true for thousands of years, while on a shallow subsoil, like that of England, where it was tried, it in time necessarily failed, for if your lamp is but two inches deep, it cannot burn without replenishing as long as you live, of course. Were it not for a seeming egotism, and want of space, I would here detail my personal experience in this line with a piece of land that has been in constant culture for thirty years under the plow, and for the last ten years under an annual cropping of a kind that is usually supposed to utterly exhaust the richest soil in two or at most three years, and yet I confidently expect a better crop the next year, in the same line, than the last, simply because I have prepared my ground better, though without a spoonful of manure. It makes no difference how this fineness of soil is secured—whether it be done with rollers and harrows and plows in the spring, or during the culture of the crop throughout the summer, or whether it be done by fall plowing, (on soils which will not run together,) and the snows and frosts of winter be trusted to do the work; or whether the field be laid down to grass, till the fine, piercing grass roots, working at it during the moist springs and falls, penetrate into every clod, and thoroughly disintegrate it, till it will again boil up before the plow, as it moves along in the furrow, like a kettle of boiling plaster of Paris—either of these ways, or any other way, to get the soil FINE, will at once set

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all of these great processes of absorption and attraction into operation again, on good land, with a good, deep subsoil, with the same power as when the land was first plowed, or if the soil be covered with manure or ashes, the alkalies and acids of which will eat it into fineness to some extent, as well as add both to its absorbing and nutritious power by their own presence, it is all well. If the work is only done, nature does not stop to inquire how it is done, or who or what did it; she simply makes her own deposits in the bank thus prepared, more or less, and goes on, asking no questions for means sake nor "for conscience sake." It is self-evident, however, that on these soils, when there is an actual exhaustion, with no subsoil below for a further supply, the crop can only be recruited by manures—just as your shallow lamp must be filled if it has actually burnt out. It is equally evident, also, that the cheapest way of fining an old cloddy field is either to fall plow it or to lay down to grass for a year or two, when the ground can be spared for that purpose, which will effect the end more perfectly and cheaply than any practical process of art by harrows and rollers, as all know who have tried it. But I have no idea that one-half the soils that are supposed to be exhausted in the West, are exhausted by anything but the ignorance and shiftlessness of their cultivators, and a new plowman would revive them at once. And some of those who have read books on this subject are only a great deal more ignorant, practically, than they probably would have been if they had never read anything, for the books themselves have no broad and just comprehension of the true philosophy of the whole subject; it is only an everlasting dabbling in mere isolated details —like setting up one or two single finger-boards to guide a man out of a labyrinth a thousand miles square.

But, although the mass of the soil plowed cannot be too fine or too much comminuted—at least by any process of art—it may be too loose and puffy, too full of air, for each of the purposes mentioned, both of the roots and of the processes of absorption; and land new plowed, without rolling, is very apt to be so, especially if plowed till it is fine, or if designed for wheat. Hence we so often see the best corn and wheat on the headlands, where the teams have tramped it most. This is both because their tramping has made it fine in quality—that is, it has broken up all the lumps and clods, as the roller would have done—and has also made it properly compact, instead of leaving it light and puffy and full of superfluous air; for if the soil is too light and porous and open, even if fine, the air will pass into it too freely and dry out again all its deposits of moisture or gas as fast as it makes them, while all other processes from below will be interrupted from the same cause, for neither absorption nor capillary attraction can go on where the materials are too coarse or too loose and open, or too close and compact, no more than a lamp can burn with a wick made out of tow shives and chips, or of untwisted cotton, or from a pine board.

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Simple FINENESS and COMPACTNESS is what is wanted, both in the plowed wick of the field and the burning wick of the lamp, without either COARSENESS, or HARDNESS, or LOOSENESS. Hence the winter's frosts and snows put many soils, plowed in the fall, into the best possible trim for a crop. Others, which run together more freely, they leave too hard, and they will need plowing again in the spring, and perhaps rolling, too, if found too lumpy or puffy.

Whether, in *subsoiling*, the bottom furrow should be left below, or thrown to the top, depends wholly on the season of the year and the nature of that subsoil. It is seldom well to throw much of a subsoil that has never been stirred to the top in the spring of the year, for it will rarely become sufficiently fine and rich in its texture to answer well the purposes of a surface soil, till it has been exposed to at least one winter's frost; and some subsoils are totally unfit ever to be brought to the surface, except by slow degrees, and should be left, therefore, at the bottom. But some subsoils, so-called, are exactly of the same character as the soil above, and in that case, of course, it matters not which is at the top.

Underdraining is a sort of short hand way of virtually plowing the ground three feet deep instead of one foot or less, for by reducing the general water level in the soil, especially if inclined to be wet, and by the action of the water trickling through its pores, it increases its power both of absorption and attraction, much as a very deep plowing would do; and all such methods of permanently deepening the power of the soil cannot be too highly commended to all those who have the means and the tastes for such outlays.

III. I have thus spoken of the chief defects of the upper surface of the plowed field, and in the mass of the land stirred. I come now to speak of the defects at the bottom of the furrow slice, which are almost universally overlooked, and are still of the utmost importance. They relate mainly to two points: *First*, too great a degree of *hardness*, amounting, in some cases, to an almost absolute impenetrability; and, *second*, too little *facility* of *drainage*.

Suppose a man, on a close adhesive soil, naturally inclined to pack and bake hard under any pressure, like most of our soils at the West, has intended to plow his farm well, and has actually done far better than most of his neighbors. Suppose he has plowed it year after year, for twenty years, full six inches deep; every year the sliding of the heel of his plow, and the tramping of his horses in the furrow, year after year at the same depth, in all sorts of weather, wet and dry, has plastered down and tramped down the subsoil at that depth, until it is now about as hard as the bottom of an iron kettle—and if he had taken his farm to the foundery and got a cast iron bottom put in it six inches below the surface, it would hardly have been in a worse condition than it really is; the poor man avers that he has always plowed deep, (which is true,) and still he gets but small crops. Now let him be persuaded to

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set his plows only two inches deeper, and rip up this cast iron bottom—and by this time it has got so hard that, on some soils, it will probably take an extra span of horses, if not more, to do comfortably even that—well, what is the effect, and what is the cause? Why, the effect can be told in two words—a *fine crop*. But the cause is said to be that he has brought into use simply two inches more of soil. It is all fudge; he has, in fact, brought into use perhaps twenty, perhaps one hundred, feet more of soil. On his old "*cast iron*" plan, it is true, that the roots of his crops would in some way contrive to struggle through the hard pan that he had thus created, or he would have had no crop at all. But the nice and more delicate capillary attraction from below, which a single straw can interrupt, could not get along with it so well; this could not burst through the bottom of that iron kettle until he broke it anew with his plowshare, though from his good culture above it struggled manfully to do so. It did all it could to help him, recognizing his real merit, but it could not do it till at last he helped himself by setting his plow a little lower and doubling his team, then away goes his cast iron under crust, and up come the substantial riches, not of two bare inches, but it may be of twenty feet, or even a hundred feet of subsoil. That man has "struck a lead," as the miners say, and ten to one if he don't run his deep plowing hereafter clean into the dirt, and swamp all his oats and wheat in the process.

This case of a hard-pan, either natural or artificial, is analogous to that of a tight thread or wire wound around the lamp wick below, and stopping the capillary attraction upward.

2. The next fault of the bottom of the furrow-slice is want of drainage. Now, surplus water, as we all know, is a great evil, especially in some spring seasons in Illinois, when it cannot stop to rain, but must pour all the time, Sundays and all. If we pour water on the table or floor, we observe that it will literally, to a certain extent, pile up before it will begin to run at all, even when there is nothing in its way. But if we make or mark a crease, or lead, however small, with the finger or a knife, it will immediately begin to run off. But most of our plows cut the bottom of the furrow-slices perfectly level, like the table or the floor, and make no leads, or crevices, or drains, by which the surplus water can begin to run away; the inevitable result is, that on wet lands, and in wet springs, it stands and soaks, and seeps, day after day, and sometimes week after week, till it is literally boiled away by the heat of the sun, thus taking all the proper natural heat out of the soil, which should have been reserved for the crop, as well as flooding both the field and crop with an utterly unmanageable quantity of surplus water. Now, suppose that instead of this awkward arrangement, the plow should be so constructed as to make a proper drain in the bottom of each furrow to lead the water off; and suppose that each such drain should draw off but a single barrel of water in a wet time, in twenty-four hours, then in each twenty-four

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hours we should ordinarily get rid of two hundred and forty barrels per acre and save to our crops precisely the amount of heat from the sun per acre which it requires to boil away two hundred and forty barrels of water, besides securing the comfort and convenience which work on drier land always gives to man and beast, in addition to the increase of the crop.

Now, all know what a splutter the lamp wick makes when surplus water gets into it, and how all its functions are stopped at once. It is true your standing or surplus water on the plowed field makes less fuss, but only because it induces at once the paralysis and stillness of death, and these great processes are all as fully stopped for the time as they are on the surface of the sea, as heretofore explained.

The practical result of these principles will be that a man should plow deep or shallow, according to the nature of his soil and the crop in view; generally deeper on compact barren lands than on rich black prairie soil; generally deeper for corn than for small grains, especially on rich black lands, and always as light as possible when the main object is to kill grass or weeds, as after harvest on stubble lands. But if a crop of corn is to be put at once upon grass land, *trench plowing*, either with a Michigan double plow, or with one team after another, is needful, if not indispensable. On wet or flat lands the ground should be plowed in narrow lands, so as to convert the dead furrows into natural drains, if the ground is not underdrained, as the loss by standing water is much more than the loss by the dead furrow, though made deep year after year; especially is such ridging, preceded by deep plowing as deep as possible, under the trees on the crown of the ridge, indispensable for orchards and fruit yards on flat lands, though underdraining is still better. In plowing corn, the first plowing, after the harrow or roller, should be as deep and close to the roots of the young corn as possible, but NEVER near enough to cut them; for nature never gives any more roots than are needed, and though the cutting the roots may not lessen the amount of fodder or stalks, it surely will that of the corn. Never cultivate more than half the same row at once, unless you take the whole of it, as all modes of lapping the culture in the middle of the row are just so much waste power of the team. If thorough or double culture is given anywhere, it should be close to the corn, where it will do some good, and not in the middle of the row, where it can do little or none, except to waste the strength of the horse for nothing.

In *all possible cases* make the ground *fine* and *free from water* as possible, at whatever depth plowed, either by plowing in the fall or winter, so that the frosts may fine it, or by rollers, draggles, harrows, or whatever else can be made to do it most effectually. And the more frequently and thoroughly such crushing and pulverizing processes are repeated, whether the crop is on or off, the better will be the crop; for, as we have seen, *pulverization—fine-*

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ness—is more important to these great processes of nature than depth, or any other single item. Hence bar-plows, though the best of all instruments for killing weeds in corn, are the worst of all for the cultivation proper of the soil, for, in fact, they do not cultivate cloddy land at all, they merely roll it up in the sun and make it more cloddy than it was before, and often lay bare and cut the roots of the young corn so as to diminish the crop from ten to even twenty bushels per acre, while still the stalks grow well. Some form of the double shovel plow, either for one horse or for two, will always, in common seasons, give more corn to the acre with less labor than any other mode of cultivator or plow that I have ever seen, for it leaves the ground *deeper*, *finer*, *smoother* at the surface, and better *drained*, and therefore better prepared for *heat*, for *attraction*, *absorption*, and for a *nidus* for the roots of the young corn. Frequent culture, so as never to allow any crust or hardness on the surface, is also of more consequence than even deep culture, for reasons explained above. I will not say what instruments I think will secure all these ends better, and with less labor for man and beast, than any other, for my business is now principles, not implements; but I will say that whatever implement, or theory, or mode of culture, however fashionable or popular now, that is not based upon the principles which I have thus (though very imperfectly) attempted to explain, is destined soon to go under, for these great principles will live as long as the sun shines, or the dew falls, or the water runs into the sea; and if we fight against them, we fight at once both God and nature, and shall not be likely to succeed; but if we would at once conform all our implements and processes to them, it is my firm conviction that the same labor of man and beast, in Illinois, would produce at least double the crop we do now.

And now, my friends, I care not whether I or any one else can mathematically or scientifically demonstrate one single thing I have said to you, or whether mere theoretical and philosophical men receive or reject these principles, I still believe that they are substantially true, and I know that if you work upon these principles *you cannot be greatly led estray in the* PRACTICAL RESULT. And if I can, by any means, lead you to think and to feel that when you are plowing you are not simply turning over dry clods of dirt in the field, but that you are plowing the sun—plowing the ocean—plowing the air—plowing all the hights above and all the

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INSECTS INJURIOUS TO VEGETATION IN ILLINOIS.

By Cyrus Thomas, of Murphysboro, Illinois.

INTRODUCTION.

Although so much has already been written in the Agricultural papers of Illinois, in regard to injurious insects, yet in an essay or treatise of the kind this is proposed to be, such general directions and explanations should be given as will make what is written intelligible to readers who are not entomologists. Therefore, I propose to give in this introduction a short history or sketch of the transformations and classification of insects, together with such portions of their external anatomy as must necessarily be used in describing species or genera. Although the method of arranging species in their scientific order in a treatise on economical entomology, is, by some well qualified to judge, not considered the best plan, yet with our present knowledge of species and their habits in this State, it is our only plan. And we have for a precedent the example of Dr. Harris, whose "Report on insects Injurious to Vegetation" has earned for him an undying reputation. And although this essay may be considered as a second report, that by Mr. Walsh having preceded it, yet as he has given no introductory outlines of the classes, I think they may properly be given here.

As no one supposes the great Prairie State of the West will be content with two short reports of fifty or sixty pages each, therefore, what is thus given by way of explanatory introduction should be sufficiently minute to save future repetition.

The term *animal* is supposed by many, even well informed persons, to be applied exclusively to those animate beings of the higher orders, as Quadrupeds, Birds, &c. But this is a mistake that a little thought ought to make apparent to any one who entertains it. Insects as well as Quadrupeds, Birds or Fishes are true animals. And a glance at the arrangement of this great kingdom will enable the reader more readily to comprehend the extent of the insect class, than anything else. If we follow the arrangement of Cuvier, which is that adopted by Prof. Agassiz, we divide the kingdom into four divisions, as follows:

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1. *Vertebrate Animals.* Those having a back-bone, as Quadrupeds, Birds, Fishes and Reptiles.

2. *Articulate Animals.* Those having a jointed or articulate covering corresponding to the internal Skeleton of vertebrate animals—as Lobsters, Crayfish, Spiders, Insects, etc.

3. *Molluscous Animals.* Animals with soft bodies, as the shell-fish.

4. *Radiate Animals.* With the organs arranged around a centre.

Burmeister, a Prussian naturalist, has adopted a somewhat different arrangement, yet founded on nearly the same principles.

1. *Osteozoa.* Bone animals—same as the Vertebrate.

2. *Arthrozoa.* Limb animals—about the same as the Articulate.

3. *Gastrozoa.* Ventral animals. This includes the Mollusca and Radiate of Cuvier.

Thus it will be seen the *Insects* belong to the division of articulate or limb animals. The latest arrangement of this division, which is given by Dr. Leconte, in his "Classification of the Coleoptera of North America," is as follows:

1. Class.—*Insecta.* Body permeated by air vessels.

2. Class.—*Crustacea.* Body without air vessels. Thorax distinct from the abdomen.

3. Class.—*Vermes.* Body without air vessels. Thorax not distinct.

The Class *Insecta* is again divided into three sub-classes, thus:

1. *Insecta.* True Insects. Legs six.

2. *Arachnida.* Spiders. Legs eight.

3. *Myriapoda.* Millipedes, etc. Legs numerous.

From this it is apparent that the term "Insect," when properly restricted or scientifically used, does not include such animals as Spiders, Millipedes, Ticks, Crayfish, Intestinal Worms, earth Worms, etc., but is only applied to those that undergo a series of changes called transformations, and that in their perfect state are furnished with six legs, and mostly with wings. These transformations are in many cases so remarkable, that, possessed of all the laws of nature, we could not from them predict them; experience and observation only can show them. That a loathsome crawling Caterpillar, and the gay Butterfly, are one and the same insect in different states of its existence, we all know. But who from an investigation of it in its first state could have predicted its character in its perfect state? And therefore, very appropriately has this first or worm state or portion of insect life been termed the *Larva* state; the word signifying a *mask;* because in this state the future form is more or less masked.

But before speaking of this stage of insect life, we must for a moment advert to a previous stage of their existence. With few exceptions (such as the Blow-flies,) all insects are produced from eggs, deposited by the female perfect insect. These eggs are of different forms according to the different species; some globular or

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nearly so, which is the most general form, others conical, cylindrical, etc. These are deposited in various situations according to the habits of the different species. Some diving into the earth, others seeking the waters, some leaving them exposed on limbs, leaves and stems of plants, others boring into vegetables and depositing them there, while the parasites often deposit their eggs in the body of their victim. Some of these eggs are hatched out in a few days after being deposited, while others pass through the cold, wet and changes of winter, and are hatched out the following spring or summer. Those of a given species, it must be remembered, all following the same plan, that is, all hatch the same season, or all hatch the following; some few exceptions known.

The forms of the *larvae* are very different in the different orders, as will be seen when we come to examine the characters of these orders. It is in this preparatory state that insects prove most injurious. The Army-worm, Chinch-bug, Hessian-fly, Apple and Peach-borers all commit their depredations during this portion of their existence. In this state they are wingless, and pass most of their time in eating; growing rapidly, and frequently casting their skins. This is also, generally much the longest portion of their lives. Many species that have strong horny jaws in the larva state, drop them in the perfect state, and instead thereof have long fleshy tubes for mouths. It should be stated here that the prevailing form of larvæ is cylindrical; that many, especially of the Caterpillars, are furnished with false legs, to which the term *pro-legs* has been applied. These are thick fleshy legs, not furnished with single strong claws, but a broad foot, surrounded by a fringe of minute hooks scarcely perceptible by the natural eye in any instance.

Although it has been stated that most insects deposit their eggs before hatching, yet this is not universally the case. Several species of the fly-family bring forth their larvæ alive; while in the case of the *hippoboscidæ*, a very singular family, belonging to the Diptera, the young before cast advance to the pupa state; this family embraces sheep-ticks, bat-ticks, etc. And finally among the Plant-lice we find still another anomaly. The parent having deposited her eggs in the fall, dies, these eggs hatch, all females, which arriving at maturity bring forth, in the larvæ state another brood of females, and so on for six or seven generations. But the last fall brood is composed of males and females, then the female deposits her eggs for the next spring brood.

The larvæ (in general) having arrived at the period in which that state is to terminate search for a suitable place to undergo the strange transformation that is soon to follow. Some sink deep into the earth, others hide beneath stones, logs, in chinks and crevices, others spin around themselves silken cocoons, others hang themselves, head downwards, beneath some projecting eave, rail, plant, limb or leaf, others remain in their wooden burrows, or in the fruit which has nourished them, or in the insect that has afforded them food. They

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cease to eat and enter upon a state resembling a death-like sleep. They are now called *pupæ* (singular *pupa.*) This period of their existence is not generally as long as the larva state, though in a great number of cases they remain in it through the winter.

It is in this state they undergo that wonderful change, whereby the footless grub is changed to the active beetle, the caterpillar to the butterfly or moth. A change that was long the study of Swammerdam, Malphigi, Reaumur and De Geer—a change that Dr. Herold has investigated with all the ardor of a naturalist and advantages of an accomplished microscopist; but yet which remains a change by no means fully and satisfactorily explained. The theory of Swammerdam, that beneath the larval skin lay hid the moth or beetle, has been dissipated by the elaborate researches of Herold. As will hereafter be seen, all species are not inactive in this portion of their lives—some passing through it without loss of appetite or change of form, save the addition of rudiments of wings, as in case of Bugs, Grasshoppers, etc.

Having undergone their transformation in the pupa-state, and shed their skins, they enter upon their last and perfect state, to which the name *imago* or perfect insect is given. And when a species is described or spoken of, or the term *insect* is used, unless the state or period of existence is mentioned, it is always to be understood as applied to the imago or perfect insect.

The word *Insect*, means to *cut into*, and was applied to this class of animals to express one of its chief characters, that of having the body partially divided into three parts by cross incisions or indentations. The three parts into which the insect is thus divided have been respectively named, as follows:

The front part containing the mouth and bearing the antennæ, and eyes is the *Head.* The middle part, supporting the legs and wings, is the *Thorax.* The hind body, containing the greater portion of the intestines, and the genital organs, is the *Abdomen.*

Beginning with the head and moving backwards in our survey of the external horny skeleton, the mouth is the first and chief organ used in the classification of insects. The mouths of some insects are furnished with strong horny jaws made for biting; these insects are called *mandibulate;* others are furnished with sucking tubes for mouths; these are termed *haustellate.*

In mandibulate insects the upper horny jaws are termed *mandibles:* the lower, more delicate and less exposed jaws are called *maxillæ.* The upper lip is the *labrum*, the under lip the *labium.*

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under the breast, as in the Hemiptera, and is called a *rostrum* or beak, and in other cases a thick short tube ending in fleshy lips, as in the common flies. *Antennæ*, are two long jointed organs, one of which is placed on each side of the head, between the angle of the mouth and the eyes; in common parlance they are usually termed horns. These appendages or organs are of various forms, some slender, bristle-like, others cylindrical, toothed, notched, branched, feather-like, clubbed, forked, etc. Some are very short and mostly hidden, while others are very long and prominent. In addition to the ordinary eyes, many insects have one, two or three little single eyes placed near each other on the crown of the head, these are called *ocelli* or eyelets, (singular *ocellus*.)

Although the term *thorax* has been adopted as the name of the middle division of the insect, yet it is very often used to designate the upper surface of this portion; also, the term *tergum* is applied to the same part. To the breast or underside of the thorax the names *pectus* and *sternum* have been applied, though the latter strictly applies only to a part of the breast. The latter triangular piece often seen between the base of the wings is the *scutel* or *scutellum*.

In those insects having four wings, two of which in repose cover and hide those beneath, as in Beetles, Grasshoppers and Bugs, the upper ones are called *elytra*, or wing-covers, the under ones *wings*. The legs have different names applied to their different parts. The thighs are called *femora*, (singular *femur*); the shanks *tibiæ*, (singular *tibia*); the toes or terminate joints collectively *tarsi*, a single joint *tarsus*. Between the thigh and the body are two small joints, generally unimportant, but frequently so large as to aid in description; the one next the body is the *coxa*; the one next the thigh *trochanter*.

Although insects appear very sensible to external impressions, yet they have a very small brain, and a simple and not very extensive system of nerves. Although it is admitted by most entomologists that insects are possessed of the senses, sight, hearing, smell, taste and touch, yet the organs of sight only have been satisfactorily determined. The organs of taste are supposed to be in the mouth. The organs of smell are placed by some in the antennæ, by others in the palpi, and by Burmeister in the mucous tunic of the tracheæ or air-tubes. The organs of touch are variously located by different authors, in the palpi, antennæ and tarsi. And lastly, the sense of hearing is located by Burmeister in the antennæ, in which opinion he is supported by such authors as Reaumur, Carus, Strauss-Durckheim, Oken, etc. While Treviranus describes a small drum-like membrane on the forehead as the organ. Miller considered the chirping apparatus of the grasshopper as the organ of sound. And finally, others assert it is wholly unknown.

The circulatory system of insects is very simple, consisting of a single dorsal vessel lying along the body just beneath the dorsal

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muscles. It is divided into several compartments, having no apparent outlet, but the blood, a cold and often colorless fluid, is supposed to permeate the walls of this vessel and penetrate to the various parts of the body. The organs of respiration are more complex and singular. Insects do not breathe through their mouths, but through little holes called *spiracles* or *stigmata*, generally nine in number, placed along each side of the body. These spiracles open into short air-tubes connected with two great longitudinal vessels or tubes called *tracheæ*, which emit ramifying branches to all parts of the body.

The digestive system is quite simple, being, generally, a single tube, divided into compartments performing the various functions of the craw, gizzard, stomach and intestines, with occasionally attached biliary vessels. In insects, the sexes are always in separate individuals. And among the Hymenoptera (Bees, Wasps, Ants, etc.,) is found an anomaly, that is, a neuter gender.

Dr. Harris has given four thousand eight hundred as the estimated number of species inhabiting Massachusetts. Taking this estimate together with the number of known Coleoptera inhabiting Illinois, and the proportion this order usually bears to the whole class, we may safely estimate the total number of species belonging to this State at six thousand. To attempt to describe all these species separately would require quite a number of volumes, and be a useless task, unless arranged in some kind of classified order. In order to meet this difficulty, naturalists have arranged all insects in groups, having certain characters in common, by which one group may be known from another.

The sub-class *Insecta* is thus divided into seven or eight large groups, called orders, having for their chief distinguishing characters, the nature of the wings, metamorphoses and mouth.

1st Order—Coleoptera. (Beetles.) Biting or mandibulated insects. Larvæ grubs. Wings, four; two upper, thick corneous wing-covers, called elytra. Many species injurious; some aquatic.

2d Order—Orthoptera. (Cockroaches, Crickets, Devils-horses, Grasshoppers, etc.) Mandibulated insects. Wings, four; upper pair thick, leathery. Larvæ, like the perfect insect, except that they are destitute of wings. Pupæ active, with rudimental wings. All the species injurious, except those belonging to the family *Mantidæ*, which are carnivorous.

3d Order—Neuroptera. (Dragon-flies, etc.) Mandibulated

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late insects, having a spiral proboscis. Wings four, covered with branny scales. Larvæ, caterpillars, with feet, and distinct head. Species mostly vegetable eaters in the larva state.

7th Order—HEMIPTERA. (Bugs, Cicada, Plant and Bark-lice, etc.) Haustellate insects, having a horny, jointed beak or rostrum bent under the breast. Wings, four, anterior pair leathery and various; posterior pair membraneous. Larvæ resembling the perfect insect, yet wanting wings; pupæ active. Some species injurious.

8th Order—DIPTERA. (Musquitoes, Gnats and Flies with two wings.) Haustellate insects, with a short fleshy or horny sucking tube. Wings, two, membraneous, in place of the posterior pair are two pediculated knobs, called *halterers*. Larvæ without feet. Pupæ quiescent, and transformation complete. Many species injurious, others predaceous.

Besides the foregoing orders, several others have been formed by Entomologists, but as they are chiefly subdivisions of those named, or contain insects of little interest to the agriculturist, I will omit any further mention of them.

Taking the ratio of carnivorous species, as given by Mr. Walsh in his essay,* at one-fourth, and deducting another fourth for non-injurious species, we will then have, according to the foregoing estimate, three thousand injurious species found in Illinois. This will give at least two injurious species to each species of plants. This, it must be remembered, applies more particularly to the original condition of the State, before it was so materially changed by the hand of the agriculturist and the march of civilization. But when the woodman's axe felled the trees of the forest, and the bright plowshare turned the prairie sod, the natural counterpoise between plants and insects was disturbed. And, although the insect food was thus destroyed, the greater portion of the latter remained. Where then were they to turn for nourishment? Nature, though governed by fixed laws, will as far as possible adapt herself to circumstances; the ascending stem will wind around the clod or stone it cannot penetrate, the groping vine will seek the struggling ray that strives in vain to reach it. And so the hungry mouths, deprived of their native food, find in the wheat and cornfields, meadows, orchards, gardens and vineyards, a rich return for their loss. But this is not the only effect of the disturbance, for these introduced plants not only suffer from the attacks of these new enemies, but their old foes of other climes, like blood-hounds, are pursuing. Thus that golden grain, the staff of life to millions, in its travels from shore to shore, from country to country, at every step has gathered new foes, until now their name is legion. Nevertheless, nature, though slow-paced, does not forget her favorites, and following into the footsteps of the unwary foe, she sends a host of wily parasites to check the progress of the devastating hordes. But

*In 4th Vol. Transactions Illinois State Agricultural Society.

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ever-changing man makes it necessary nature should also constantly be struggling to adapt herself to these varied conditions. An injurious insect makes its appearance, introduced perhaps with some new plant, for a few years it increases in numbers, proving more and more injurious each returning season. But at length an enemy from its native haunts appears, and the vast numbers melt away before their destroyers, until they sink back to their allotted proportions. Yet the continued change in the method of farming, as well as of the farm products, and the continued expansion of cultivated boundaries assist in keeping up this disturbance. But as to the antidote we will speak hereafter, and now turn to the descriptive part of our work.

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COLEOPTERA.

This order consists of the various species of beetles, or, as they are sometimes called, "hard-shelled bugs." But the word bug, when properly used, is only applied to the *Heteropterous Hemiptera*, the tribe containing the "Bed-bug." The characteristics of the order *Coleoptera*, although briefly given heretofore, may be more fully stated, as follows: They are biting insects, having strong and horny mandibles, and more delicate jaws. Having two wings and two wing-covers; the latter, which are termed *elytra*, being horny cases, meeting in a line along the back; the posterior or under wings being membraneous, and when the insect is at rest folded beneath the wing-cases, so as generally to be completely hidden. The word *Coleoptera* signifies wings in a sheath, hence the name of the order. All the species of this order undergo a complete transformation; in the larva state they are true grubs, some few, such as those that reside in nuts and other fruits being footless, but the greater portion have feet. Having changed into pupæ they are completely inactive, wrapped in their hard outer skin, like a mummy in its bandages; and, as a matter of course, cease eating until they come forth perfect insects. When they reach the perfect state, they as well as all other true insects, cease to grow, and a little beetle will never become a large one, a little fly will remain a little fly until it ceases to exist.

This order contains more species than any other, amounting to nearly one-third of the whole class. There are probably fifty thousand known species already determined, named and catalogued. In the United States at least ten thousand species have been determined; and in Illinois about one thousand of the named species have been ascertained. And it is very probable that when all the Illinois species have been determined, the number will reach sixteen or seventeen hundred. As I know of no better plan to pursue than the one I adopted in my "Entomological Notes," published in the *Prairie Farmer*, I shall follow it, which is, first to give

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family characters and then describe those species belonging to it that are most numerous and most injurious. And while passing through a portion of the order, I will be compelled to pass over the same ground traversed in my "Notes;" but in order to make this essay connected so far as it goes, this cannot be avoided. It does not matter to me how much I am accused of copying, if I can place before the farming portion of our citizens that which will benefit, and which is not otherwise easy of access. Where we wish to describe a species or a family, our description, if correct, must correspond with that of former writers, whether we take it from the insect or the books. I will, in all cases, where I have the specimens at hand, take my specific descriptions from them, so that if I misname I may not misdescribe.

MELOLONTHIDÆ.—This is the name of the first group of beetles to which I invite attention. By the English entomologists this group is usually raised to the rank of a family; by Latreille it was given as a subdivision of his great family *Lamellicornia*, a name given to an extensive group having antennæ terminated with a lamellated club. It is at present included by Dr. Leconte in his *Scarabeidæ*, corresponding with the Linnæan genus *Scarabæus*, and the *Petalocera* of Dumeril. And is thus distinguished: Antennæ with the terminal joints forming a lamellated club, (a club of flat, plate-like joints) the joints moveable. Legs with spines suited to digging.

The *Melolonthidæ*, which by this arrangement will be considered a subdivision of the last named family, may be further distinguished thus: The body is oblong-oval, convex, generally thick and fleshy, mostly of a brownish color, varying, according to the species, from a dull yellow to a dark brown or black; also, varying in size from one-fifth to one inch long, (this applies to the species of Illinois. The antennæ have from seven to ten joints, including the joints of the club, (mostly ten;) the club is always lamellated, that is, composed of plates folding like the leaves of a book, sometimes of six or five, but usually consisting of three joints or plates. The mandibles are furnished at base on the inner side with an oval space crossed by ridges like a file. The wing-cases do not cover the whole of the abdomen, leaving the hinder extremity exposed. The legs are rather long, the first pair armed externally with two or three teeth, and the claws at the tips of the feet are notched beneath or split at the end. The species feed exclusively on living vegetable matter.

Lachnosterna pilosicollis, Knoch.—The hairy-necked leaf-eater. This is the *Melolontha pilosicollis*, Say.; *the M. tristis*, Fabr., and *Phyllophaga pilosicollis*, Kn. and Harris.

Head and thorax reddish-brown, covered with long pale yellowish hair. The head has the front edge entire, rounded and slightly turned upward, punctured; it is small, much narrower than the thorax. The thorax is also punctured, lateral edges suddenly dilated in the middle, convex above. Scutel triangular rounded at the tip, reddish-brown, punctured, hairy. Elytra pale reddish-

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yellow, punctured but not grooved, covered with hair, the suture dark red, and the margins of the suture or central meeting line, a little deeper shade, slightly ridged and less punctured and less hairy than the other portions of the elytra. The breast is hairy; the entire under side of a bright reddish-brown. The club of the antennæ pale yellow, and three jointed. This species makes its appearance in the perfect state, in the central and southern parts of Illinois, early in May. And when the ground is being spaded or plowed in April hundreds of them are cast out, already in the perfect state, but then of a pale creamy color. Some warm, sultry evening, early in May, about dusk in the evening, they can be seen struggling through the thick grass beneath which they have undergone their transformations. At first they appear scarcely able to rise, disengaging themselves from the grass, and taking wing, for a few moments they move slowly along just above the grass, making a dull, buzzing and peculiar noise. At length they succeed in gaining a hight sufficient to clear the fences and the shrubbery, when they start off, generally in considerable droves and in one direction, following the current of the air if a breeze is stirring, or pursuing the course of some lane or valley. If caught and examined at this time they will be found of a much paler color than above described. I recollect one season, some three or four years ago, to have noticed an army of these insects moving through our town from west to east, a breeze setting that way. They commenced moving at dusk, and continued passing until nine or ten o'clock at night. They moved along just over our heads, one occasionally striking our hats; the column appeared to be eight or ten feet deep, but not regular; of its width I had no means of judging. Although I use the word column, I would not be understood as intimating they were in close order, being two or three feet apart. They remain in the perfect state two or three weeks, and, having paired and deposited their eggs, die. At what time the female deposits her eggs I am unable to say, but from the fact that they live but a short time, we may conclude they are deposited about the first of June. I have before me a gravid female which was taken about the first of last June. This species, in all probability, like the European Cockchafer, (*Melolontha vulgaris*) deposits its eggs some inches in the ground beneath the roots of the grass. From these in the course of a few days, or few weeks at farthest, are hatched little whitish grubs, with six legs on the anterior part of the body, and with strong brown jaws; the grub, when fully grown, somewhat resembles the grub of the common dung-beetle, but is smaller. It is slightly enlarged behind, and when at rest is generally coiled up and lying on one side; in fact this appears to be its natural position. It is supposed the larvæ of this species, as well as of other species belonging to this sub-family, remain in the larva state from three to five years. These larvæ, in connection with those of other allied species, have proven exceedingly injurious, not only in

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other countries, but in Illinois, devouring the roots of grass to such an extent as in some cases to destroy whole meadows. Dr. Harris, in speaking of *L. quercina*, (another species also found abundantly in this State) says: "The grubs devour the roots of grass and of other plants, and in many places the turf may be turned up like a carpet in consequence of the destruction of the roots." I have seen a similar complaint in regard to the actions of the same insect in Ohio; and in the *Prairie Farmer*, October 17, 1861, I see a somewhat similar complaint respecting this insect, from DuPage and Will counties, in Illinois, by Mr. Clifford. The latter writer also states that it had destroyed five acres of strawberry plants for Mr. Kidder. Mr. Walsh tells us in the same paper (August 9, 1860) that he is satisfied the larvæ of this species is guilty of cutting off young corn and other young plants. And my own observations have convinced me that one great difficulty the farmers in this section meet with in attempting to have meadows, is the injury caused by the larvæ of these insects. I am inclined to the opinion that while the *L. quercina*, or "May-bug," prevails in Northern Illinois, the *L. pilosicollis* is most abundant in Southern Illinois. And the statement by Mr. Walsh (*Prairie Farmer*, June 13, 1861) that he has taken but a single specimen of the latter in the vicinity of Rock Island, goes to prove that species is not distributed in equal abundance throughout the State. The same article states that this species, in the perfect state, proved very destructive to rose bushes, raspberry bushes, vines, and even fruit trees, in the neighborhood of Pana, Illinois, eating the leaves and buds. Before closing, in regard to the larvæ of these insects, I may add that M. DeHaan has given the following character by which to distinguish these from the larvæ of allied tribes: "Head broad as the body; terminal segment bilobed."

For the purpose of identification, I will give short descriptions of a few other species of this tribe found in this State.

L. quercina, Knoch.—It is of a chestnut-brown color, smooth, not hairy, but finely punctured; each elytron, or wing-case, has two or three slightly elevated, somewhat irregular, longitudinal lines on it. The breast is clothed with fine, short yellowish hairs. Length about nine-tenths of an inch. Some specimens are very dark brown, almost black.

In order to avoid confusion, I will give a list of the synonyms of this genus and species. First of the genus, *Lachnosterna*, Hope; *Phyllophaga*, Harris; *Anoylonycha*, Blanchard. I take the first, because adopted by Dr. Leconte in his late work. The synonyms of the species are *quercina*, Knoch.; *fervida*, Olivier; *fervens*, Schonherr; *drakii*, Kirby.

The grub of this species is a white worm, with a brown or blackish head, and as much as an inch and a half long, and when fully grown as large as a man's little finger. In addition to what has already been said concerning this species, Dr. Harris states that

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the perfect insect feeds on the leaves of trees, especially those of the cherry tree.

L. balia, Say.—Chestnut-brown, head and thorax very dark reddish-brown, head almost black. Body cylindrical; head punctured; the upper lip (or strictly clypeus) broadly notched and slightly bent upwards, beneath this is a fringe of recurved hairs; thorax and breast slightly hairy: scutel semi-circular; elytra punctured, not striate, hairy, lighter color than the thorax. Legs somewhat long and slender, beneath bright brownish red. The claws of the feet are furnished with a strong tooth on the middle, and are angled at the base. Length about five eights of an inch; width, across the elytra, three-eights.

Dr. Melsheimer speaks of this species being very abundant at a certain season of the year, and of the loud humming sound produced by them after night, and that it is common on the leaves of deciduous forest trees. This species is more abundant here than *L. quercina*. Its habits are similar to the other species named.

Serica sericea, Knoch. (*Omaloplia sericea*, of Harris.—This is a small beetle, varying in color from a light brown to almost black, with a silky lustre. Head with a few hairs on it, densely punctured, front slightly turned up, and slightly notched; thorax punctured; scutel longer than wide, triangular; elytra striated or grooved and punctured; anterior tibial two-toothed. Length about one-third of an inch. A variable species, of which a light colored variety is found in considerable numbers here.

S. vespertina, Schonh.—Is similar to the last named species, rather smaller; head and thorax reddish brown, elytra paler; head densely punctured, clypeus reflected, emarginate at the sides; elytra deeply grooved, intermediate ridges convex, grooves irregularly punctured; beneath, dull reddish brown.

Dr. Harris says the two last species attack the leaves of the sweet-brier, on which they are found in profusion in the evening, about the last of June. I have generally taken them on low shrubbery and about blackberry patches. I am, therefore, inclined to the opinion they feed, in the perfect state, chiefly on the buds and leaves of the various species of *Rosacaea*. I am, in fact, inclined to believe the normal habit of the insects of this sub-family in the perfect state is to feed on *Rosaceous* plants; while in the larva state they feed on the roots of the various species of *Graminæ*.

Macrodactylus subspinosus, Fabr.—This is the noted "Rose-bug," or "Rose-chafer," and has been so thoroughly noticed in numerous periodicals throughout the northern portion of the country, that I can add nothing to what has already been written. Although so destructive in some parts even of our own State, yet, so far as I have observed, it is rare in Jackson, Franklin and Williamson counties. Some years ago, when first entering upon the study of Entomology, I received a box of named insects from a friend, among these was one marked with this name. The kind

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thus marked is abundant, (a Cetonian) but is as different from the "Rose-bug" as cow is from a deer. The "Rose-chafer" is about one-third of an inch long, body slender. It is covered with buff colored scales or down, which give it a brownish yellow appearance. If these scales are rubbed off, the head, thorax and under side will appear black, and the wing-covers a light brown. The antennæ brownish yellow, black at the tips, nine-jointed, the terminal club three-jointed.

Dr. Harris says, (in his latitude, Massachusetts,) they come forth from the ground during the second week in June. From Dr. Fitch's reports and newspaper articles concerning it, I suppose (for I cannot say from personal observation) that it appears in this State about the first of June. From the last named author we also learn that a few years back it was quite destructive in Mercer county, in this State, to apple orchards, invading the trees when the young apples were about the size of hazelnuts, gathering upon them like swarming bees, wholly consuming the fruit and attacking the leaves. But it appears to be confined to certain localities, and I have searched our agricultural papers in vain for three years past to find any serious complaint against it. Various methods for its extermination are given by the two authors named, but the most effectual seems to be destroying by hand, shaking into water, vessels, sheets, or something of the kind, so they can be destroyed. But this is sometimes impossible, on account of their immense number.

Before proceeding to give any further remedies against the insects I have described, I will give descriptions of two or three other species, which, although not embraced in *Melolonthidæ* as above restricted, yet differ but little from the characters of that sub-family.

Pelidnota punctata, Linn.—About one inch long; front of the head bronzed, the posterior part (of the head) greenish, with a coppery lustre. Thorax brownish-yellow, with a black dot on each side. Scutel dark green. Elytra brownish-yellow, with three black dots on each. Beneath, dark green. Antennæ ten-jointed, terminal club three jointed. This species is quite common in Southern Illinois, yet I have not found it to be very injurious. Dr. Harris states that it is found on the cultivated and wild grape-vine, sometimes in great abundance, during the months of July and August. In this latitude it makes its appearance as early as June. Dr. Leconte says the various species of *Rutelini*, the tribe to which this species belongs, live on the leaves of trees. Although we have an abundance of wild grape-vines in this section, yet I have found it more numerous about cultivated grounds than in the woods. The larvæ reside chiefly in decaying stumps and roots.

Anomala varians, Fabr.—Is a small species scarcely one-third of an inch long; having the head and the thorax, of the male, greenish-black margined with pale yellow, thickly punctured. The wing-covers are a dull yellow, occasionally varied with indistinct

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brownish splotches; grooved, and punctured in the grooves. Legs, and all beneath, brown. This species is subject to considerable variations in color. It is said to depredate upon grape-vines and Sumac, but the specimens I have observed, by no means few, have generally been found in fields on the larger weeds, blackberry-bushes, and other shrubs. I know nothing concerning its larvæ.

Although the larvæ of the foregoing species differ more or less in their habits, yet as has been stated, they are mostly injurious to meadows and grass lands. And as they are hid beneath the ground while committing their depredations, it is exceedingly difficult to reach them, so as to dislodge them. And as the perfect insects generally hide themselves during the day time, their extermination is difficult in this state. Various methods, as burning the sod, to kill the larvæ, and destroying the perfect insects by shaking them from the trees and burning or crushing them, have been adopted; but generally with partial or but little success. In some of the European countries children have been hired to gather and destroy the Cockchafers; which after all is probably as good a method as can be adopted in our country. Washes as a general thing, are but poor remedies, especially where entire fields are to protect. They may do sometimes to save a favorite tree, bush or vine, or a single garden bed, but to attempt their application to field crops is a waste of time. I should think the application of gypsum, or something of that nature, appropriate to the plant, and calculated to assist its growth, would be one means of counteracting the injury of these species.

M. Taverny, in experimenting on the larvæ of the European Cockchafer, ascertained that the most violent poisons did not affect them, whilst alkalies proved speedily destructive. This may be a guide where topical applications are possible. Hogs and domestic fowls are fond of them, and so far as we will give them an opportunity, will assist in destroying them. It is said the skunk is fond of the perfect insects, but raising this quadruped for this purpose is not likely to be resorted to. I have occasionally seen ants attack even the perfect insect and destroy them despite their desperate struggles to escape, but this generally happens to individuals in some way previously injured. It is probable their most dreaded enemies in their larva state are to be found among the carniverous *Coleoptera*. In France, the golden ground-beetle devours the Cockchafer, and although this species is not found here, yet species closely allied and with similar habits are abundant, some of which likely prey upon our "May-bugs." These carniverous ground-beetles generally hide under rails, logs, wheat-shocks, hay-stacks, etc., and when the farmer removes these things and sees a number of flat, dark beetles hastily retreating to some hiding place, he should not interrupt them, they are his friends, and have been there in search of his enemies.

I think that a frequent change of place in meadows, although

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attended with trouble, is the surest remedy in Illinois, where the soil is so deep and easily penetrated. As the prairies are plowed up and cultivated, the disturbed insects must seek nourishment in the meadows and fields of grass.

LUCANIDÆ.—This family may be easily determined by the following distinct characters:

Antennæ ten-jointed, usually bent or geniculate, the terminal joints forming a pectinate club, but not movable. Legs suited to burrowing; tarsi slender, five-jointed, last joint long. (Be it remembered, the five-jointed tarsi are common to many families.)

Lucanus dama, Fabr.—The Stag-beetle. This is a well known species, easily distinguished by the enormous mandibles of the male. It is of a mahogany color, the surface of the entire insect being smooth and polished. The upper jaws of the male are extended into long, curved, horn-like appendages, furnished internally beyond the middle with a little tooth. Length about one inch and a quarter. I have described this species from Dr. Harris and some specimens I have, and this is the name given to the specimens in the various cabinets in Illinois, and to the specimens sent to me, and it is certainly found here, but some specimens I have taken here, and that I have seen thus named, do not correspond with that description. I will, therefore, describe a specimen from my collection. The head and elytra a mahogany-brown, the thorax a shade darker, the underside of the abdomen red, the thorax and head covered with white, silky hair. The upper jaws are nearly three-fourths of an inch long, curved, slightly punctured with very fine, distant, superficial punctures; on the inner edge of these about one-fourth of an inch from the head, or one-third their length, is a strong spine-like tooth, pointing slightly backwards, beyond this, along the inner edge, there are on each jaw from eight to ten little square black teeth, the tips are forked or pronged, the upper or outer prong being the largest, and about one-fifth of an inch long. The head is broad, kidney-shaped; a sharp, semi-circular ridge running around from immediately above one eye to the other; this ridge has a deep, broad, rounded fissure dividing it on the top of the head. Thorax much broader than long, widened a little behind the middle, a little rougher than the head or elytra, by what appear to be confluent punctures. Elytra, with very fine, shallow punctures, a few larger ones near the dorsal suture. Legs long and slender, nearly equaling the entire length of the body. The antennæ abruptly elbowed at the end of the first joint, which is half the whole length, and hairy, and enlarged at its outer end; the terminal club four-jointed. From immediately over the anterior canthus of the eye arises a spine which extends backwards and obliquely downwards nearly half across the eye. Length, exclusive of the jaws, one inch and three-eighths; length of elytra, seven-eighths; width of head, five-eighths. This applies to the male. The female is about one inch and a quarter

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in length, similar in color and markings, except that the breast is not so hairy. The jaws are much smaller, hardly one-third as long as the males, with a single internal tooth. The legs are much more robust and shorter, while the spines on them are much stronger. Although I have never seen a description of the *L. elaphus*, Fabr., yet I am strongly inclined to believe these individuals belong to that species, and for the present I give them as such. The grubs of these insects are long and thick, nearly cylindrical, and of a whitish color, furnished with strong jaws, six feet, and lying on their sides, as other Scarabæian larvæ. They reside chiefly in the trunks and roots of trees. The *dama*, according to Dr. Harris, preferring old apple trees, willows and oaks. The *elaphus* (or species last described) appears to be most numerous in the neighborhood of Oaks and Tulip-trees ("Poplar.") I recollect to have caught a female on a Cottonwood on the bank of the river one evening. The perfect insect is found here in July, and probably as early as the latter part of June. They are fond of the sap and sweet vegetable juices, which appear to be their principal food in this stage of their existence.

I will describe another very common species belonging to this family, which, although not injurious, should be known, that it may not be charged with the crimes of others.

Passalus cornutus, Fabr.—Black or blackish over the entire surface, occasionally tinged with red beneath and along the sides. Mandibles exserted, broad or rather deep and strong, a tooth on the upper edge beyond the middle, and about three strong teeth at the tips; inclosing between them a brush of dark red hair. Antennæ elbowed, hairy, terminal club four-jointed. Head narrower than the thorax, wider than long; from the center of the head a broad, flat, bent hook or horn in the shape of a snake's head, bending forward; on each side, just over the eye, is a short ridge extending backwards and inwards. Thorax almost square and slightly convex, rounded at the posterior corners, smooth, a single indented line along the centre. The elytra, deeply and regularly grooved. Legs robust, spined and hairy. Length about one inch and a half, width half an inch. The larvæ of this species are very large white grubs, found in old decaying or quite rotten logs, where also the perfect insect is usually found; their only food appears to be the decaying wood. They certainly are not injurious, but on the contrary are beneficial, hastening the change of vegetable matter into soil.

Elateridæ.—There is scarcely an individual, child or adult, to be found who is unacquainted with the "Spring-beetles," or as they are often termed, "Jumping-Jacks," "Snapping-Jacks," "Click-beetles," etc. The insects of this family are distinguished by long, narrow, flattened bodies, tapering behind, and of a firm consistence. The posterior angles of the thorax are produced into spines extending along the shoulders of the elytra. The breast of the front thorax is extended forward beneath the mouth, and is also pro-

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duced backwards into a long point or process which is received into a groove or excavation in the middle of the breast. These insects have the power, when placed upon their backs, by a sudden jerk, of throwing themselves upwards from the surface on which they are lying, and falling on their feet. The internal processes and muscles of the thorax are so arranged, as to give them the power of rapidly and forcibly bending the body at its middle joint, and the external process of the breast gives direction to the force. The anterior portion receiving the greater impetus, the body turns over in the air, and the insect regains its feet, which from the shortness of its legs it would otherwise be unable to do.

The larvae of these insects are long, slender, cylindrical worms, the surface smooth, the segments distinctly marked by the cross cut or incision, but having no indentations. They have received the name "Wire-worms," from their shape. They are all vegetable eaters, some residing in felled or dead timber, whilst others live in the ground, feeding on roots, especially of the grasses. The great difficulty of tracing them through their transformations has left us in ignorance, in most cases, as to what species a particular larva belongs.

The largest of our species is the *Alaus oculatus*, Linn. General color black, covered in some places with a white down, especially on the head, thorax, base of elytra and beneath. Head much narrower than the thorax; antennae deeply serrated, (*i. e.*, teeth on one side, like a hand-saw,) nearly as long as the thorax. The thorax oblong, longer than wide, with blunt spines at the posterior angles; marked on each side of the middle with a large, elliptical, velvety, black, eye-like spot, surrounded by a ring of white down. Elytra grooved. Length generally something over one inch and a half, width half an inch. The larvae of this species is a long, slender, smooth, sub-cylindrical worm, when fully grown exceeding two inches in length. Its general color is a creamy yellow, with a reddish tinge in some parts; the head and upper side of one or two of the front segments, dark brown; the last segment black, having a semi-circular notch at the end, furnished internally with little saw-like teeth. Dr. Harris says he has found many of these grubs in old apple trees, where they had devoured the wood. I have taken them from dead trees and old logs in the fields, and often found them in company with the larvae of *Passalus cornutus*. Whether they depredate upon the roots of plants that often penetrate these decaying logs, I know not.

Cratonychus brevicollis, Herbst. (*Melanotus cinereus*, Harris.) This species is about three-fifths of an inch long, of a uniform, reddish-brown color, covered with short, depressed, pale, yellowish hairs, which give the insect an "ashen hue." Head, convex, rounded on front edge; antennae pale red, short. Thorax convex, not contracted near the lateral spines; spines obtuse, basal margin, having a distinct fissure. Elytra striate, punctured with regular

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lines of punctures. Tarsi hairy, claws pectinate. Dr. Leconte, (Class F, Am. Coleoptera, 1861, page 170), says: "Our species are numerous, and all belong to Melanotus, for which I unfortunately adopted the more recent name, *Cratonychus*, in my revision of the Elateridae of the United States." Yet, on page 32 of the same work, I find he adopts the name *Melanotus*, for a genus of Harpalini, therefore I retain the name above given of this genus.

This species is abundant in the timbered portions of Southern Illinois, and probably throughout the State. I have frequently shaken them, as well as other kindred species, by dozens from a single hickory bush. They appear in the spring, about April, and continue until June.

C. communis, Schonh. This species closely resembles the last, but is smaller, being only half an inch long; is rather lighter brown, and the thorax has a longitudinal indentation or furrow in the middle, deepest on the anterior half. This species, although not so abundant in this section as some others, is by no means rare.

Monocrepidius lobatus, Say. General color, an ashy brown; being covered with light, prostrate hairs, gives it the ashen hue. Front edge of the head broad and rounded; antennae, pale, brownish, first joint longest. Thorax longer than wide, lateral spines acute. Elytra very regularly grooved, with stitch-like punctures in the grooves, the elevated lines between the grooves, flattish. Legs, a dull yellow, with the next to the last joint of the tarsi large and extending beneath the terminal joint, and blunt at its extremity. Length, half an inch. This species is also found in abundance in Southern Illinois, but as I do not find it in either the list furnished me by Mr. Walsh, Dr. F. Brendel, Dr. Helmuth, or of the Evanston Institution, I presume it is rare in the Northern part of the State.

Besides these species I have named, there are a number of others, natives of Illinois, some of which may be more numerous and injurious in other parts of the State than those described. And before leaving the family I will describe another species not found in the list published in the Transactions Illinois Natural History Society.

Melanectes morio, Fabr. The entire surface is a shining black. The mandibles have a reddish tinge in the middle, are toothed at the point. The head and thorax finely punctured with numerous shallow, indistinct punctures; head slightly depressed in front, antennae scarcely as long as the thorax. Thorax convex in front, flattened behind; lateral angles strongly spined. Scutel oblong, rounded and hairy. Elytra, apparently smooth, marked with regular rows of fine punctures. Underside a polished black. The tarsi lined beneath with a row of yellow hairs. Length one inch and a quarter, width, three-eighths of an inch. This is found under stones, logs, etc., but I have taken them in the daytime on the wing. I know nothing of the larvae.

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As before stated, there is great difficulty in ascertaining to what species a given larva belongs, on account of the long time they remain in this state, which is several years, and the great difficulty in rearing them. All the entomologist can do, until these insects have been more carefully traced through their transformations, is to give general directions.

Thus, if the farmer finds a long, slim, cylindrical, smooth worm, with six small feet close to the head, depredating upon the roots of his grass, shrubs or garden vegetables, he may take it for granted it is the larva of this family. Then from April until June of each year let him keep a close watch for a beetle, and if he finds one similar to those described, in numbers corresponding with the numbers of the larvae, he may safely presume he has found the miscreant. Then destroy him in any way his ingenuity may suggest. To what extent these insects have proven injurious in our State, I am unable to say. I have seen several complaints in the papers, and have heard some farmers speaking of a worm doing considerable injury, which, from the description, I supposed was the larva of some Elater. And Mr. Walsh tells us in an article in the *Prairie Farmer* (Aug. 9, 1860,) that they were numerous in his plowed ground. I am strongly of opinion that some species depredate upon our forest and fruit trees, especially such as have been damaged. And I find Mr. Westwood speaks of their (the larvae) residing "under the bark of trees, etc." Klippart, in his "Wheat Plant," (page 630), in speaking of the depredations of the "wire-worms," says: "Sometimes the common wire-worm will ascend into the stems of a plant to feed, and even come forth of a night, or in a dull day, to revel upon the leaves; but they prefer keeping beneath the soil, as they cannot endure the sun or dryness; and as they dislike cold, in severe winters they retire too deep into the earth to do any mischief at that season." Moles, it is said, prey upon these larvae, and it is highly probable the various species of *Scalops* (our moles) destroy a great number of these worms. We also have several species of two-winged flies that prey indiscriminately on these and other species of insects. These are large, hairy, long-bodied flies, with stout thorax, slender, tapering abdomen, robust legs, and varying from three-fourths of an inch to an inch in length. They belong to the family of Diptera called *Asilidae*. They can pierce the hardest beetles with their keen lancet tongues. The carniverous ground-beetles also attack them, and are probably their chief enemies. And Klippart, on what authority I do not know, says a species of Hymenoptera (*Proctotrupe*) is parasitic upon the larvae. The last named author recommends as remedies, top-dressings of soot, lime, salt, nitrate of soda, etc. When a meadow or other field becomes very badly infested, I should think plowing it up late in the fall, and exposing the worms and pupae to the frost, would be the best thing that could be done; especially if the hogs and domestic fowls at the same time had access

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to it. This, if correct, would apply with equal force to the *Melolonthidae.*

BUPRESTIDAE.—The characteristics of this family are as follows: Antennae inserted upon the front of the head, eleven-jointed, serrate, that is, notched on one side like the teeth of a saw. The head sunk in the thorax to the eyes. Thorax widest behind, fitting close to the abdomen. Elytra covering the abdomen and tapering posteriorly. Legs short; tibiae usually slender; tarsi five-jointed, (as are all the foregoing families.) These species are generally elongate in form, somewhat flattened, and often highly ornamented with metallic colors.

Chrysobothris femorata, Fabr. This species is of a dark, dull greenish color, with a strong coppery lustre, deepest on the forehead and tips of the elytra. The head is immersed in the thorax to the eyes, the obtuse front is clothed with fine, whitish hairs. On the middle of the top of the head is a short, smooth, raised black line. The thorax is about as long as the head is wide, convex, with a slight longitudinal indentation on the middle, punctured and somewhat uneven. Elytra wider at the shoulders and as far back as the middle, than the thorax, but from this point they taper back to the tips. On each elytron are two irregularly oblong, impressed, transverse spots, which generally are of a deeper green or copper color than the surrounding surface; these sometimes appear double. The whole of the upper surface appears as though slightly sprinkled with an ashen powder. The underside and limbs are brilliant coppery; the feet a bright green. Length, about half an inch.

Dr. Fitch has given the best account of the habits and history of this species that I have seen, therefore I will borrow freely from his article thereon in the first volume of his valuable Reports. He describes the larva very minutely, from which we extract the following: Length, about seven-tenths of an inch. It is soft, flesh-like, of a pale yellow color. Head small, deeply immersed into the second segment, the jaws black. The third segment very broad and large, being nearly twice the width of any of the posterior segments; it is rather broader than long, its upperside occupied with a large, oval, callous-like elevation, covered with numerous brown raised points. Much injury has been done to the apple-trees in various portions of the West by this larva. And I am of the opinion that much of the injury charged to the *Saperda* or "Borer," (as the latter is termed by way of pre-eminence), at least in Illinois, is done by the *Chrysobothris;* and a similar opinion is expressed by Mr. Walsh in his paper on Injurious Insects. I know that so far as my observations have extended, the *Saperda* is rare in Jackson, Williamson or Franklin counties, while the *C. femorata* is abundant. And Mr. Walsh tells us in his article in the *Prairie Farmer* (May 17, 1860) that he has searched diligently in the orchards around Rock Island for the *Saperda*, but failed to find it;

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while on the other hand, he found eight individuals of the other species in one apple tree.

Dr. Fitch says the insect now under consideration (*femorata*), when found in its natural place, in the larva state, is in the White Oak. I certainly have found larvae answering the foregoing description in our smooth-bark Hickory, in sections where the forest had not been much disturbed, and where but few apple trees were near. In a quotation made by the Dr., from the *Ohio Cultivator*, it is contended by the editor that in nearly or quite all the cases where these borers had infested a tree, there were evidences of its having first been injured. And I find that a Mr. Hamilton, in 1860, in the same paper, again brings forward the same opinion. He says he examined a thousand or more young trees and found the following facts:

"1. The borer begins his ravages on the south-west side of the trees.

"2. Every tree damaged by the borer, was either crooked, or leant towards the north-east.

"3. Every tree damaged by the borer furnished unmistakable evidence of having been damaged before the borer began his work."

He then goes on to argue, by way of explanation, that as most of the winds in that section were from the south-west, they cause the trees to lean toward the north-east. And by this means the rays of the sun during the hottest part of the day would fall at right angles upon the south-west side of the tree. That this intense heat loosened the bark at this point, and this causing it to split, an opening to the inner surface was thus made, where the female borer could deposit her eggs. In regard to the effect of the sun *in the winter* on trees similarly situated I have heard Prof. Turner express a similar opinion. And notwithstanding Dr. Fitch says the operations of this insect are by no means limited to old and decaying trees, yet this may be one means of affording a lodging place to them. The eggs are deposited on the bark of the stem, or in such hiding places therein as the female can find. The worms having hatched from these, pass into and for a while consume the soft sap-wood immediately beneath the bark. But when approaching maturity they gnaw into the more solid wood, forming a flattish or oval burrow, extending upwards.

It is useless for me to repeat in extenso the various remedies that have been proposed for this and other borers. Such as washing or rubbing with soap, injecting various liquids into the burrows, plugging in camphor, running in wires, cutting out with a knife, etc. Putting soap on the trees I think is beneficial, and does, to a certain extent, keep off insects; and soapsuds occasionally cast about the roots is also good for the trees. Cutting out with a knife, where it can be done without killing the tree, will certainly prove effective.

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I may as well here as elsewhere give some notions of my own, not only applicable to this case, but to others.

The fruit grower when he plants out his orchard, must, like the general of an army, in the midst of a hostile country, study well his position, and the enemies against whom he has to contend; lest in attempting to avoid or overcome one danger he rushes into another.

First, then, it is best to grow his own trees, and not seek those of a different climate or soil. And they should not be pushed forward with all the rapidity of which the soil is capable; but on the contrary should be kept back, though not to such a degree as to stunt or dwarf them, but just enough to allow the roots to gather full strength, and the wood to harden evenly and properly. They should be kept trimmed and clean, so that a redundancy of sap may not accumulate at any one point. They should, if possible, be so situated as to be at least partially sheltered from winds, especially on the broad plains of our State where the winds have such a lengthy sweep. And I can't help but think the suggestion of the *Ohio Cultivator* and Prof. Turner, to plant the trees perfectly straight or leaning slightly to the south-west, is a good one. The ground should be *properly* cultivated, but what *degree* of cultivation is proper I am not sufficiently experienced in horticulture to say, but certainly such crops, if any, as are not likely to introduce insects injurious to trees, should be raised. This much is certain, to-wit: that the ground should be kept clean, and the surroundings clear. And I cannot help thinking hedges are not good things around orchards, they most certainly afford splendid hiding and breeding places for a variety of insects, although surrounding forests or groves may be a protection, if composed of a variety of trees. If his orchard is in the midst of an unbroken prairie, an annual burning of the grass will do no harm; if surrounded by a forest, firing the woods will not injure his trees. Fire is a purifier, and I have great faith in it, if properly applied. Having done all this, let him, by specimens or otherwise, learn to know those insects most likely to prove injurious to his trees, and keep a close watch for their first appearance, and as soon as any are detected, open war upon them without regard to conventionalities or any set plan. Adopt such methods as his own good reasoning will suggest. Where the perfect insects can be caught let them be "utterly destroyed," and that without mercy; a few dimes, or what is better, a few appropriate books bestowed on careful children, as a reward for the destruction of these pests, will not be in vain. If you have no children of your own, or not enough, a few dimes thus given to those of your poor neighbor will not be lost. Children are not slow in distinguishing species, their ideas are not so fixed on the "mighty schemes of mice and men" that they cannot concentrate them on so small a thing as an insect. A little "soft-soaping" of the trees along in June will probably aid some in preventing the borers from depositing their eggs, as it is about that time their laying season

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comes on. But he must not risk his orchard on the success of one method or preventative, let him adopt that most appropriate to each particular case. If he sees that a few larvae have effected a lodgement in one or two trees, exterminate them even at the expense of the trees, if unable to do it otherwise; for if once fixed in an orchard they are to it as a cancer to the body. *Vigilance* is the watchword of the fruit-grower, and is worth more than all the nostrums ever invented by *savans* or tree doctors. Before the orchard space was cut from the forest or isolated from the prairie, nature's choristers there carolled forth their joyful notes over the feasts they enjoyed. Why not still permit them to do so? a few accommodations here and there arranged for their use would not be labor lost. During the winter nature covers the ground beneath deciduous trees with the fallen foliage, and I am inclined to the belief it would be well to follow her example. For these *leaves* (leaves it should be, if anything,) would protect more carniverous beetles than injurious ones; true, some other injurious insects, especially of the *Hemiptera*, would there find a hiding place. But Lady-bugs are easily obtained, and can easily be colonized in the winter, and they would assist in keeping down the species of the last named order. And lastly, fruit should not be allowed to remain and rot on the ground, but gathered carefully from the trees, and when that on any tree begins to rot or become in any way diseased, it should immediately be picked off and disposed of. And I would, by way of suggestion, state to our fruit-growers, that it is probable the soil of this State would be benefited by *lime;* the proper method of applying it I cannot give.

Dicera lurida, Fabr. This species is of a dull brassy color above, mingled with smooth, elevated black spots; beneath, of a bright copper color. Head narrower than the thorax, deeply immersed, upper lip slightly projecting, covered with bright brassy hair, the obtuse front studded with brassy, elevated points; antennae shorter than the thorax, strongly serrated, black, with brassy lustre. Thorax scarcely as long as wide, broadest behind, fitting closely to the wing covers; rough, brassy, with obscure black lines. Scutel very minute. Elytra imperfectly striate, more regularly near the tips than the base, the suture and margins bordered with interrupted purple lines, the tip of each elytron ending with two sharp little spines. It varies in length from slightly over five-eighths to three-fourths of an inch; width, nearly a quarter of an inch.

It was probably the larvae of this species, which is common here, that I saw depredating upon the hickory, which is said to be its favorite tree. It is found from the latter part of June until August.

Agrilus lateralis, Say. This is a pretty little species, easily distinguished. It is very narrow, sub-cylindrical and about one-fifth of an inch in length. Front of the head a dark, dull, coppery color, with a deep central indentation extending from the thorax to

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the upper lip. Thorax nearly as long as broad, somewhat widened near the front by the depressed sub-margin; rugose, and very distinct, deep but dull brassy color throughout. Elytra narrow, nearly parallel, and black. Beneath, black. I have taken this little species in considerable numbers on White and Post Oak bushes. It also frequents the flowers of various weeds.

Besides these there are several other species of the family found in the State, as the *Acmædera tubulus*, Fabr., having five yellow punctures on the elytra, etc., but as I have not studied the habits of these, I shall not attempt to describe them.

The Bostrichians, or *Bostrichidæ*, is a small sub-family of PTINIDÆ, and contains a few species that I think are quite as injurious as any timber-boring species we have. The body is generally long, cylindrical and blunt pointed, and our species dark brown or black. The blunt rounded thorax is advanced forward over the head, which latter is small and hangs beneath the thorax. The antennæ are rather short and terminated by three enlarged joints. The grubs are white, fleshy, furnished with six legs and wrinkled on the back. Generally somewhat enlarged in front and gradually tapering posteriorly, and coiled in a semi-circular shape. The European entomologists do not appear to have traced very carefully the transformations of these insects, yet one figure of the larva of *Bostrichus* (Apate) given by Ratzeburg in his Forst-Insecten, and quoted by Mr. Westwood, corresponds exactly with larvæ I have observed here in timber.

Bostrichus bicaudatus, Say.—A dark reddish-brown, almost black on the thorax. Head small, not advanced beyond the hood-like thorax; the mouth furnished with a fringe of yellowish hairs; antennæ a dusky red, the three terminal joints much larger than the others and bead-like. The thorax suddenly bent down in front and somewhat so behind, anterior half, especially the frontal declivity, covered with spine-like points, which on the lateral angles before become recurved spines. Elytra shagreened, paler than the thorax, the shoulders with an external smooth prominence, the tips suddenly bent down, at which point (in the males) from each extends backwards a sharp spine, (in the females) there is a smooth prominence. Beneath, very dark brown. Length, nearly three-eighths of an inch; width, one-eighth.

The first notice I have seen of this or any congeneric species being injurious to fruit trees. is found in the *Prairie Farmer*, (November 24, 1859,) Mr. R. W. Waterman, of Will county, having inclosed the editor some specimens, accompaying which he wrote as follows: "I inclose you some specimens (and their work) of bugs that are working in my apple trees. They work in the top of the tree—in where the branches fork, or near, or between the bud and the branch." This short but explicit letter has placed a brand upon the Bostrichus that will forever accompany him. The editor gives the name of this specimen as *Apate* (Bostrichus) *as-*

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pericollis, Ger. He also sent me some of the specimens, but when they reached me were too much damaged to be determined. I am now of the opinion they belonged to the species above described. Mr. Walsh, in the same paper, (May 17, 1860,) speaks of the *bicaudatus* injuring apple trees in his neighborhood, and also states that "they commence just above a bud or small off-shoot, eat their way downwards through the pith and heart wood." Not only is Mr. Walsh's determination sufficient authority as to the identity of the species, but his figures leave no doubt on this point. I have not observed these insects at work on apple trees, but have frequently traced them out of hickory limbs, which I think is their favorite native tree. I am also inclined to think their usual habit is to attack it when deadened, cut down or damaged, before becoming perfectly dry, yet I do not think they are by any means confined to these.

Since I commenced writing this essay, while sitting on our court house steps, I picked up a hickory switch to whittle on, the knife soon exposed the burrows of some grubs. Examining these carefully, I found there were some three or four, originating behind a little bud or knot on the branch. Very small at the entrance, they increased as they advanced; at first, for a short distance, they moved diagonally, apparently to avoid each other, and close to the bark, after that moved straight down the limb nearer the center. Tracing these up, I found two quite small and apparently very young larvae. They were short, thick whitish grubs, doubled into a half circle, small head, anterior segments largest, tapering rapidly towards the tip, rugose on the back by cross indentations; six very minute feet. These larvae evidently were not half grown, not reaching one-fourth of an inch in length. The heart of the same twig appeared to have been perforated by a previous occupant, probably belonging to the same species. From Mr. Waterman's letter, and Mr. Walsh's article, it would seem the perfect insects gnaw into the twigs and do the injury described by them, and the uniformity in the width of the perforation figured by the latter, accords with his statement. Thus far we have facts to guide us, as to the rest we must arrive at it chiefly by reasoning. In the vicinity of Rock Island, according to Mr. Walsh, the perfect insect appears the first week in June; in this county (Jackson) they are seen as early as the latter part of May. I have noticed them very frequently of a warm evening, just at sundown, flying along very slowly in considerable numbers, a few feet above the ground, with the hind body hanging obliquely downwards. This is probably pairing season. The female probably soon afterwards deposits her eggs in the burrows before described, from which the grubs are hatched the same season. These, I think, continue to work until the severe cold benumbs them, and in the latter part of the winter enter the pupa state, or, what is quite probable, may remain in this state for more than one season, and the small size of the larvae

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I observed, if belonging to this species, would favor this opinion. It is difficult, until we are better acquainted with the habits of this species, to suggest any specific remedy. They can easily be caught with nets when flying about of an evening, and each one thus destroyed would lessen the danger threatening the trees. Carefully burning the prunings will also be a preventative, not only against this, but other insects.

B. basilaris, Say.—Body black; antennae and palpi rufous; thorax spined in front, somewhat as *bicaudatus*, angles rounded; elytra with large dense punctures, which are more dilated towards the tip, a large rufous spot on the middle of the base, lateral edge tridentate, sutural and terminal edges elevated; wings black; beneath, impunctured; length, one-fifth of an inch.

According to the most recent arrangement of Coleoptera in the work of Dr. Leconte, heretofore cited, this species should be placed in the genus *Sinoxylon*, and the *bicaudata* in *Amphicerus*. I know nothing from personal observation of the habits of the *basilaris*, only that it is a native of Illinois. Dr. Harris says the shagbark, or walnut tree, is sometimes infested by the grubs, "which bore diametrically through the trunk to the very heart, and undergo their transformations in the bottom of their burrows. Several trees have fallen under my observations which have been entirely killed by these insects."

There is also another species found here, but which I am inclined to believe is undescribed, at least I do not find it described in any of the works I have access to. It is one-fifth of an inch long, narrow, cylindrical, of a deep rust color; thorax rough but not spined; elytra striate, punctured, unarmed. It is probable this species works under the bark of sugar trees, as I have found it in the neighborhood of these.

There are a number of other species belonging to the family *Ptinidae*, that are very injurious to forest and shade trees throughout our State, but as our species do not seem to have been carefully studied, I am unable to add anything to what has already been written.

Cerambycidae.—This is an extensive family, easily distinguished, and to the species of which the names "long-horned" and "Capricorn-beetles" have been given. As these names indicate, they are furnished with very long antennae, seldom much shorter, and often several times longer than the body. In some cases these organs are more or less serrate, whilst in others they are long, regularly tapering, with long, cylindrical joints, like those of a reed. The eyes in most species are hidden [illegible] the base of the

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head small; often destitute of legs, and, when present, very small. They are true borers, some residing in the trunks others in the branches of trees, some in shrubs, etc.

Saperda bivittata, Say.—The history of this species has been so thoroughly written that I can add nothing in regard thereto. I will describe it, so that it may be detected by those not already too well acquainted with it by sad experience: "Body white; eyes fuscous; a small spot on the vertex, and another behind each eye, light brown; antennae moderate, slightly tinged with blueish; thorax light brown, with two broad, white lines approaching before; elytra light brown, irregularly punctured; a broad, white, longitudinal line on each nearer to the suture than to the outer edge. Length, from one-half to seven-tenths of an inch." This description is taken without change from Say's original description.

Orthosoma cylindricum, Fabr., (*unicolor*, Harris, Drury.)—This is a large and splendid insect, of a mahogany or bay-brown color. Head and thorax much darker than the elytra; antennae inserted, each on a protuberance, which are connected by a cross ridge above the mouth; head rough, a smooth central line along the top; thorax very short, broad, furnished with three strong teeth on each side; elytra narrow, almost parallel, lighter colored towards the tips, each having three slightly elevated ribs on it, and a little spine at the top; breast hairy; abdomen beneath, light bay; length, one inch and three eighths; width, three-eighths; antennae shorter than the body. Dr. Harris says this insect inhabits pine trees, but as there are no pines in this immediate neighborhood, and it is frequently found here, it must also live in other trees. Found in the latter part of the summer.

Prionus brevicornis, Fabr.—Very dark mahogany color, being almost or quite black on the head and thorax; mandibles very stout, but not long, a fringe of yellow hair between them; an indented line on the head between the eyes, and a smooth, elevated space on the apex; thorax short, broad, and furnished at each side with three teeth, the middle one nearer the anterior than the posterior; not very densely punctured, and having smooth spaces, fringed with hair along its posterior margin; elytra densely and coarsely punctured, and having on each two or three slightly elevated lines, tips not spined; breast large and hairy; length a little over one inch and a quarter; width, half an inch. This is the male, the antennae being very heavy and deeply serrated. I may be mistaken in the name of this insect, but it comes nearer the *brevicornis*, as described by Harris, (under the name of *laticollis*) than any other one of which I have the description. The *imbricornis*, Linn., inhabits this State, but I have no description of it, or specimen.

Harris says this lives in the trunks and roots of the Balm of Gilead, Lombardy Poplar, etc. It is not abundant here, and consequently cannot be very injurious.

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Our species of this family are very numerous, and, on account of their habits, especially interesting to our fruit growers. And I would like very much in this paper to give a full account of them, but from the fact that they have not been well studied, it is not possible to do so at this time. Moreover, the descriptions of several of our species are only to be found in the transactions of various societies to which I do not have access. A large number of these species were described by Prof. Haldeman, before the American Philosophical Society, Philadelphia. Therefore, under these circumstances, all I can do is to describe a few of the more important species that I have determined, thereby leaving unnoticed a number of quite important species, among which is a singular one that is very abundant on our hickories. I hope in the course of another year, if I should live, to be able to present a more complete account of this family, and of the *Curculionidae*, which is also in a still worse condition, so far as the examination of habits is concerned, than even the *Cerambycidae*.

Stenocorus longipes, Say.—Body elongated, black, punctured; head, between the antennae, concave; antennae longer than the body; thorax reddish, cylindrical, flat tuburcle each side; elytra with deeply impressed punctures, apex bidentate; posterior breast and abdomen covered with short hairs; length a little over one-fourth of an inch. Dr. Helmuth is my authority for giving this species a place among our fauna—of its habits I know nothing. Say states that he found it in Missouri Territory.

Chion garganicum, Fab., (*Stenocerus cinctus*, Harris.)—A reddish brown color, the head and thorax being darker than the elytra; covered throughout with scattered pale yellow down or hairs; antennae very long, exceeding the whole body in length; a smooth, dark red line across the face between the eyes; thorax barrel-shaped, with a sharp spine each side near the middle; scutel yellow; each elytron has an oblique, yellow partial band across it a little before the middle; commencing about one-fourth of an inch behind the shoulder of each elytron, they run obliquely inwards and backwards to near the suture. On each side of these bands the color is darker than on the other part of the elytra; tips of each two-toothed, inner teeth longest; length from seven-eighths to one inch; width, one fourth of an inch. The larvae inhabit the hickory, in which they bore long galleries lengthwise of the trunk. I have found a number of specimens here, yet it is not abundant.

Elaphidion villosum, Fabr.—Of a dull, bay-brown color, with small, scattered, irregular patches of gray hair; antennae as long, or longer than the body; eyes semi-circular; beneath the anterior canthus of each a smooth, oblique prominence; head not furrowed between the eyes; thorax barrel-shaped, not spined, rough and punctured, some smooth prominences placed in a transverse line in front of the middle; scutel small, rounded, yellow; elytra punctured with large punctures, two spined at the tips, outer spires

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largest; length of female, over five-eights of an inch; width five-sixteenths. This species appears to be found throughout the State, but not in great abundance. The larvae live in the branches of Black and White Oaks; following the pith or heart of the slender branch, they eat their way forward, enlarging as they go, until finally the branch is severed and falls to the ground. They appear here in the latter part of May and in June. Prof. Peck has given an account of the operations of the larvae of this species. "The perfect insect lays its eggs in July," (in Massachusetts.) Each egg is placed close to the axilla or joint of a leaf-stalk, or of a small twig, near the extremity of a branch. The grub hatched from it penetrates at that spot to the pith, and then continues its course towards the body of the tree, devouring the pith, and thereby forming a cylindrical burrow, several inches in length, in the centre of the branch. Having reached its full size, which it does towards the end of the summer, it divides the branch at the lower end of its burrow, by gnawing away the wood transversely from within, leaving only the ring of bark untouched. It then retires backwards, stops up the end of its hole, near the transverse section, with fibres of the wood, and awaits the fall of the branch, which is usually broken off and precipitated to the ground by the autumnal winds. Branches of five or six feet in length and one inch in diameter are thus severed by these insects. By collecting the fallen branches in the autumn and burning them before the spring, we prevent the development of the beetles, while we derive some benefit from the branches as fuel."

This quotation, although long, is so valuable that I thought it best to give it in full, as I am not personally acquainted with the larvae, though I have frequently examined oak branches thus injured that I supposed was the work of this species. The habit of penetrating limbs from the joint of a leaf-stalk, bud or twig, is very similar to the operations of the *Bostrichus bicaudatus*, and any remedy applicable to one case will prove equally so to the other, as the larvae in each case appear to remain in the branches to undergo their transformations. This species, as all others common to Southern Illinois and the New England States, appears some two or three weeks earlier here than there, being found here as early as the latter part of May. The foregoing description is taken from a female specimen, the male is some smaller, with longer antennae.

Belonging to the genus *Clytus* we have a number of species that are quite injurious to Locusts and other shade trees, mining under the bark and perforating the stems with their furrows. Some of these species are very pretty insects, with blue, purple or brown alternating with stripes of deep yellow.

Clytus speciosus, Say.—Is found in the northern part of the State, but as yet I have captured none in this section. Body black; head with yellow band on the front above the antennae; antennae

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black; thorax globular, two oblique yellow spots each side, latter longest. The elytra, when closed, appear thus: a yellow spot on each shoulder, a diagonal one on each running outward from the scutel; next a zigzag line extending across both, forming a W; next a narrow transverse band, then another a little wider, and finally the tips have a broad band of the same color, (yellow) with a spot each side of the suture of black. The intermediate color between these yellow bands is a purplish black. Length, about one inch; width, one-third. This depredates upon the Sugar Maple.

C. flexuosus, Fabr.—Antennae black, shorter than the body; a smooth, black, elevated V on the front of the head; the eyes surrounded by a band of whitish hairs, rest of the head black; the thorax round, black, surrounded by four yellow bands, next to the anterior broadest; elytra brown, crossed by five zigzag, whitish lines, shoulders and tips margined with the same; breast and abdomen also striped with yellowish white bands; length, five-eighths of an inch; width, one-sixth. The perfect insect appears in the latter part of the summer and commencement of the fall. The larvae, which are hatched out in the fall, depredate upon the Locust (*R. pseudacacia*,) eating the sapwood and perforating the trunk. I have before me now a grub taken from a Locust standing in the street. It is scarcely half grown, as they do not finish their larval state until the next season after hatching out. It is a rather slender grub, with a reddish-brown head, having a triangular depression in front and a central scallop behind, the skin of the first segment freqnently rolling loosely over these posterior margins. It is of a pale yellow color, with six very minute feet. I may be mistaken in giving this as the larva of the *flexuosus*, yet I find it in our Locust trees, about which the perfect insect may be found in considerable numbers This is the *C. pictus* spoken of by Mr. Walsh, in his treatise, as doing so much injury at Jacksonville, Bloomington and LaSalle.

C. capraea, Say.—Dark brownish-purple, head and thorax darkest; head, blunt, with two white lines down the front; eyes nearly circular, behind them a narrow, yellow border; thorax barrel-shaped, deep purple, surrounded by three very narrow yellow lines, one at each end and one in the middle; scutel yellow; elytra crossed by three yellow bands—first, a semi-circular band from the scutel running backwards and round up to each shoulder; then another, of a similar shape, about the middle, with the circle reversed; then a straight band, and a strong spine at the tip of each; length, half an inch; width, one-seventh. This, I also think, lives in the Locust, but it may be that it prefers some other tree. This is quite common in Southern Illinois.

Although there are a number of other species belonging to this order found in this State, of which I might gives the names and descriptions, the space already taken up by this family is as much as can be allowed in a paper of this length.

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As this family and the species belonging to the *Buprestidae*, are those in whose history our fruit growers and nurserymen are interested, I would suggest to them the following plan by which they can become acquainted with such species as trouble them most:

First, learn from the characters given here, or in any other publication they can get hold of, to distinguish a Buprestian and Capricorn-beetle from others. If they cannot find the characters anywhere plainly enough written, then apply to some entomologist, get him to give them in full, and a few specimens for illustration. Having learned this much, watch carefully in the nursery and orchard for any species that make their appearance; gather specimens of them, and, as far as possible, trace them through their transformations, preserving larvae, and pupae, and specimens of their work. These must be preserved and marked, and such notes made as will preserve a knowledge of what has been learned in regard thereto. Then, once a year, send these collections, with full notes of observations, to some entomologist, for him to examine them at his pleasure. But care must be taken not to mix opinions with facts, for very often these differ from each other very widely. If this was done by all of our nurserymen and larger fruit growers, it would take but a few years to have the history of Illinois "Borers" completely written.

Chrysomelidae.—Is a very extensive family, as given in the catalogue published by the Smithsonian Institution, which I desire to follow, in regard to the arrangement of families, where not changed by the subsequent work of Dr. Leconte. It corresponds with the sub-section *Phytophaga* of Mr. Westwood, in his Classification of Insects, the characters of which he gives, about as follows: The body is generally thick, of an oval, sub-orbicular or quadrate shape; head short, immersed as far as the eyes in the thorax; antennae generally much shorter than the body. In some species the hind legs are formed for leaping, having the thighs enlarged or swollen.

Lema trilineata, Oliv.—Body yellowish red; antennae black; first joint rufous; thorax contracted on each side at the middle; generally two black spots before the middle, one on each side, though these are sometimes wanting; elytra pale yellow, central suture and outer marginal line black; tibiae at the tip and the tarsi black; in outline oblong; length, about one quarter of an inch. This insect is distributed from the Rocky Mountains to New England, and is found in this State in considerable numbers. It is a leaf-eater and feeds upon the leaves of the potato. The grubs are of an ochre color, head some darker, have six legs. They are in the habit of covering themselves with their own excrement, which shelters them somewhat from the severe rays of the sun while at work upon the exposed leaves. They enter the ground to undergo their transformations, and appear in the perfect state in the latter part of May. This insect, although found here, has never appeared in such numbers as to prove very injurious. It is

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not the well-known "Potato-bug," but comes so near in its colors and markings to the *Diabrotica vittata*, or "Cucumber-bug," that care must be taken to prevent mistake. When specimens of both species are present, there is no difficulty to distinguish between them, but from the descriptions alone there is, as each species is liable to considerable variation.

Odontola scapularis, Oliv.—Body black, punctured; the head black, not punctured, with a tuburcle between the base of the antennae; thorax flattish, black, with broad, reddish-yellow margins at the sides and front; breast yellow, each side, at the posterior part, black; elytra striate and punctured; a yellowish spot on each shoulder; length, about one quarter of an inch.

This appears to be a southern insect, and probably is not found in the northern part of the State. None of the lists of Coleoptera sent me from that part of the State contain it, and I find no mention of it in Dr. Harris' work on injurious insects. It is not abundant here. I have taken but few specimens. I am not acquainted with its habits, but suppose they are similar to those of the *O. suturalis*, which Dr. Harris says is found on the leaves of Locust trees. This last named insect is found in the northern part of the State, but I have not met with it in this section. It is one quarter of an inch long, of tawny yellow color, with a black line along the sutural margins of the elytra; head, antennae, legs and underside black. These insects (of both species) appear during the latter part of the summer.

The *Hispa rosea*, of Weber, *Uroplata rosea*, M. C., also is found in the northern part of the State, whether in considerable numbers or not I have not been informed. I have not seen it in this part of the State, though it may possibly be found here. It is of a deep tawny or reddish yellow color above, marked with little deep red lines and spots; head, small; antennae short, black, and thickened towards the tip; thorax widest behind, striped with deep red on each side.

Coptocycla aurichalcea, Fabr.—The "Sweet Potato Beetle." The body broad, sub-depressed, having the thorax and elytra dilated at the sides, and in front into a broad, flat margin; that portion extending beyond the body transparent. The anterior margin of the thorax extends over and conceals the head; the whole upper surface of a reddish-yellow color; the thorax and scutellum smooth; elytra with rows of punctures, but not striate; on each side, immediately back of the shoulders, is an irregular prominence and some indentations, on the margins they have a reticulated appearance; beneath the eyes and body are black, the head and feet yellow; length, about one-fifth of an inch.

When living it has the power of changing its hues, at one time appearing of a dull yellowish color, as above described, and at other times shining with the splendor of polished brass. When dead, it loses its brightest coloring.

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This insect, as well as the following species, depredates upon the leaves and stems of sweet potatoes, proving, in this state, the greatest insect pest the farmer has to contend with in the cultivation of this plant.

Mr. Hall, of Athens, in this State, in June, 1860, sent me specimens of these insects, without stating at what time they began to appear, but I judge, from his statements, that it was some time in May, and Dr. Harris, in speaking of this species, says they begin to appear during the months of May and June. The larvae, when young, are oblong, ovate, flat, dull, greenish-white grubs, somewhat tapering behind, similar in appearance to those of the following species, which I will describe more in detail.

C. bivittata, Say.—The "Two-striped Sweet-potato Beetle." The thorax is a dull yellow, semi-transparent, with a slight greenish tinge, obscurely punctured, with a tolerable broad margin, extending over the head, at the front the margin is somewhat raised, forming an obtuse central prominence, it is unspotted; elytra with tolerable wide margin, punctured, the punctures deep, and in lines, some apparently striated; yellow, each elytron having on its central portion two shining black vittae or stripes, the outer one undulating, the inner one the shortest; the sutral margins black, which, when they are closed, form another narrow black stripe, thus, in reality, when the elytra are at rest and closed, there will be five black stripes. The margin of the elytra a clear yellow, and not punctured, but between it and the outer black stripe is a sinuous row of deep, black punctures; beneath, the body is black, the head reddish-yellow, eyes black; antennae are yellow at the base, including five or six joints, the remaining enlarged joints dull black; feet dusky; length, scarcely one-fifth of an inch; width, one-eighth. In outline this species is elliptical; convex above.

The larvae are dull, greenish white grubs, about one-fourth of an inch in length, and one-eighth in width, flat beneath and slightly convex above, oval outline, narrowest behind; the extremity being prolonged into a forked appendage, more than half the length of the body, which is laid forward over the back. Around the outer edges of the body, from the head to this appendage, on each side, is a row of fleshy spines, standing square out from the parts to which they are attached; these fleshy spines are themselves furnished with smaller spines on each side, thus giving the worm a very formidable appearance. I counted some sixteen of these larger spines along each side, but whether the number is regular or not I am unable to say. The mouth is black, and also the tips of the six short, fleshy legs, with which they are furnished; there is an irregular, slight indenture along the back; the segments are not distinctly marked, but there are numerous cross identations. It must be remembered that the forked tail and spinous fringe is a character common to many species of the family now under con-

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sideration. This forked appendage, or tail, is used to hold their excrements, which at length form a matted mass in the shape of a shield, with which they protect themselves from the sun. They can lay this flat on their backs, or raise it to a perpendicular. When about to enter the pupa state they grow shorter and broader, and the head begins to expand into the broad thoracid shield. They fix themselves firmly to the leaves upon which they are feeding, and there remain until they have passed into the perfect state. They deposit their eggs on the leaves, stems and petioles of the plants, sometimes to such an extent as almost to cover them, from which the grubs are hatched in ten or twelve days. At my request Mr. Hall, (before named) for whom these insects had destroyed a large number of potato plants, sent me a full history of their operations, his observations in regard thereto extending over some years. This he did very fully and particularly, and sent with his letter a number of specimens in all stages, from larvae to the imago. And from his statement, and the statement made by Dr. Harris, together with my own experience, in regard to the time of the appearing of the first named species, I am disposed to believe they pass the winter in the perfect state. Mr. Hall says, in a letter to me: "I have no knowledge of where they pass the winter, or how, but it must be in the imago (or perfect) state. They appear upon the plants immediately after the first warm day after they are planted, but numbers appear previously in the hot bed." And again, their habit of passing the entire length of a generation, from the egg to the perfect state, on the same plant, would certainly indicate that they pass the winter as perfect insects. It is also well known to all entomologists that many species of this family may be found throughout the winter in the perfect state, under leaves, logs, in stumps, etc. They feed upon the leaves, both in the larvae and the perfect state; but while the larvae only eats holes in the leaves, the perfect insect eats only at the edge of the leaf. The larvae are extremely voracious, employing their whole time in eating, while the perfect insect only eats while the sun is shining, in which they seem fond of basking. The length of their larval life I am unable to state with exactness, but they appear to be at least double brooded, and do not remain longer in this part of their life than fifteen or twenty days. The striped species appear to be more abundant and destructive in Illinois than the yellow species.

I have been thus particular in giving a full history of these in-

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with more effect, but not sufficient to insure success. It may be that sprinkling with lime or some alkaline substance when the dew is on, would prove more effectual. The various remedies adopted to check the ravages of the cucumber beetle, would be appropriate and as effective in the one case as the other. But I think there are two preventatives better than either. First, a change of places; the insects, as experience shows, are apt to return the succeeding year to the spot they occupied the previous season. The other is the same recommended in regard to the chinch-bug; allow them no hiding place during the winter.

Coelomera coryli, Say.—Body pale yellowish; head, with an impressed line between the antennae; antennae blackish; thorax has a cross depression in the middle; the anterior angles somewhat sharp, the posterior ones rounded; elytra somewhat dilated behind the middle, with numerous minute punctures, a much dilated blue band at the base, and a still larger one at the tips; wings black; some specimens unspotted; length, half an inch. I give this insect a place, not so much because of its injury in this State, as I do not know how that is, but because it is one of the few of the industrious. Say has given Illinois for a locality. I see it is marked as found by me in my notes, but the specimens have been sent off, so that I was compelled to take my description from Say's works. It is much larger than most of its kindred species, and through the author quoted we are informed by Mr. Melsheimer that in some places it completely defoliates the Hazel, upon the leaves of which it feeds.

Diabrotica vittata, Fabr.—"Cucumber-beetle." Head small, a shining black; antennae about half the length of the body, pale yellow at the base and dusky at the tips; thorax a glossy yellow, not punctured; an indentation each side of the middle; it is wider than the head but narrower than the elytra; elytra pale yellow, with black stripes arranged thus: one broad, black stripe along the center of each elytron, not reaching quite to the tip, and a black line down the dorsal suture partly on each elytron. They are striate and punctured in the striae with apparently double rows of punctures, very regularly and closely placed; length, about one-fourth of an inch; width, about one-ninth; the sexes differ a little in size, the male being smaller than the female. So much has already been written concerning this troublesome species, that I would not have introduced it here, but that the description might be handy for reference to prevent mistakes as to the insect. Soot, lime, aloes, soap-suds, turpentine, coal oil, tarred boxes, tobacco, and red pepper, plaster of Paris, coal dust, sulphur, snuff, glauber salts (in solution,) infusions of elder leaves, walnut leaves and of hops, decoy lights, millinet covered boxes, and mashing, are some of the remedies proposed and tried on these pests, sometimes one and sometimes another proving effectual, and at other times all failing. As they do their mischief in the perfect state, boxes cov-

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ered with something like millinet, if timely and properly prepared, will certainly prove effective in warding off their attacks. The cost in this, as in all other cases, should be counted, where the products are intended for market or sale in any way. Where they are intended for family use, and no great outlay of money is required, the contest should not be given up because a little labor is required. Prof. Turner states, in the *Prairie Farmer*, March 1, 1860, that he tried placing little square boxes round the (melon) plants, with the upper edges smeared with "gas tar." This proved an effectual preventative wherever used that season, whether it has been tried by others since I am unable to state. They make their appearance early in the spring, at least as early as April, and continue breeding until in the fall, producing two or more broods each season. Dr. Harris says the female deposits her eggs in the ground, but that he is unacquainted with the grub. If these insects pass the winter in the grub or egg state in the ground, they cannot be reached there, but if they pass it in the perfect state, surely they might be found and destroyed. Perhaps our gardeners can state in regard to this point, for surely an insect so well known and bitterly detested as this, has been observed by some one in all its stages of existence, and I fear I am exposing my own ignorance in asking the question. This species, until within the last three or four years, had not done much injury in this section, but of late years they have been increasing until they are quite troublesome.

D. 12-punctata, Fabr.—Very similar in size and shape to the last named species. Head black, with an indentation on the front; antennae pale at base, remainder dusky; thorax narrower than the elytra, yellow, smooth, not punctured, two central indentations; elytra yellow, not punctured, with six oblong, black spots on each elytron, placed two and two side by side; posterior breast black; abdomen yellow; basal half of the thighs yellow, remainder of the legs black; length, one-fourth of an inch; width, nearly one-eighth. This insect I have found in considerable numbers about the gardens and cultivated grounds, but cannot say on what particular plant it feeds, or to what extent it is injurious.

Phyllotreta striolata, Illig.—"Wavy-striped Flea-beetle." Body black, polished; head punctured; antennae pale, dusky at the tips and base; thorax punctured; elytra punctured, with a whitish stripe on the middle of each, extending from the base to near the tip; feet pale, posterior thighs dusky, towards the tips enlarged; length, about one-tenth of an inch. These little insects depredate upon the horse-radish, cress, mustard, cabbage plants, etc., in the spring, eating the young leaves into holes, attacking them soon after they come up. It is one of the little flea-like beetles that frequently destroy young plants of the cruciferous family to such a degree as to cut off entire crops. Specimens are sometimes found having two buff or yellowish spots on each elytron, and this is the variety most common in this section. This little insect is often

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very troublesome in this section in the spring, destroying young cabbage plants by eating into holes to such an extent as often to leave nothing but the veins of the leaves. I have seen whole beds of young cabbage thus destroyed, in spite of all efforts to save them. Sprinkling with ashes, when the dew is on, appears as effectual as anything I have seen tried, but the ashes should be fresh and strong. Why the *taeniata* of Say is quoted as a synonym of this species I do not know, for the *striolata* is given by Harris as less than one-tenth of an inch, which the specimens I have certainly are, while Say states the length of his species at three-twentieths of an inch.

Polygramma 10-lineata, Say.—"Ten-striped Potato-beetle." Body yellow; head with a triangular, black frontal spot. The thorax has two abbreviated lines, that are more separated in front; about six black dots on each side; elytra of a rather reddish yellow, with five black lines on each elytron, and the middle suture black; the anterior of these lines is confluent with the suture, and the exterior lines are marginal; the three intermediate ones are joined, or nearly so, at the tip; beneath, on the abdomen, are three or four rows of black spots; length, two-fifths of an inch; width, about one-fourth of an inch, or a little over. It is very convex, being nearly hemispherical, with the head bent low.

It is but recently, so far as I can ascertain, that this species has been introduced into the list of injurious insects, that is, directly injurious to the agricluturists. The first account I have of its depredations on field or garden crops was in a letter to the *Prairie Farmer*, which, together with specimens of the insect, was forwarded to me some time in last August. Mr. Edgerton, of Gravity, Iowa, who sent these, in his letter, which is published in the *Prairie Farmer*, (August 29, 1861,) says: "I send you by mail a few of the bugs I have spoken of as being very destructive on potato vines in our neighborhood, this season." He says they made their appearance on the potato vines (Prince Alberts) as soon as they were out of the ground, "and there being a cold, wet spell of weather about that time, they devoured them as fast as they were up." This was, so far as I can judge from his letter, some time during the month of June, and I know the insect makes its appearance here sometime in May. I am sorry to say that by some carelessness I sent off the larvae in a bottle of insects, and cannot now give a correct description of them, though their markings are fixed in my memory sufficient to recognize them on sight. I will state this much in regard to them. They are short, thick, fleshy grubs, of a yellowish white color, marked with dark spots, generally arranged in lines; have six feet, and are about half an inch in length. The larvae attach themselves by the tail to the leaves on which they feed when about entering the pupa state; they then begin to shorten, and grow broader, the segments appearing as though pressed up together, and a broad front piece

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covering the mouth. How long they remain in either the larva or pupa state I am unable to say, but not very long, as they are two or more brooded during a season. Mr. Edgerton says "they have raised several generations during this summer." This species is quite abundant throughout the southern part of the State, and I also have been informed it is found in the northern part. But I was not before aware that it was in the habit of devouring the leaves of potatoes, for I have usually found it on weeds and bushes in the fields, and have occasionally seen the pupae sticking upon the leaves. The attack upon Mr. Edgerton's potatoes may have been unusual for this species, and I am rather inclined it was so. But even if so, this is proof of what has been advanced heretofore, that many species, not confined to worthless weeds, bushes or trees, may, when these are destroyed by the farmer, in turn prey upon his crops and his orchards.

There are a number of other species of Chrysometians I would like to describe, but I have already taken up as much space with the Coleoptera as I can appropriate to them in this short essay. It will also be seen that I have entirely omitted the great family *Curculionidae*, containing a vast number of the most destructive species. But my reason for doing this is, not that we have no species, for on the contrary, I know of more than fifty species that belong to Illinois. This family has not received much study from our entomologists in this country, and it is difficult to name species. And those of us living in the West, who are attempting to study even the insects found at our own doors, must depend on those in the East, who have access to the libraries of the scientific societies and public institutions. The works necessary to name and determine all of our Curculios alone would cost several hundred dollars. It is well known that this family is composed of the vast hosts of "fruit-eaters," from the plums and apples of the orchards to the nuts and seeds of the forest, from the wheat kernel to the tiny grass seed.

Before closing, let us take a hasty glance over this vast order of liliputian animals, agreeing in a few characters as heretofore explained, but, under the direction of a wise Providence, ordained for very different situations and works. Yet, after all, these various offices tend to the same end, to-wit: to reduce to their original elements animal and vegetable substances. This order is most emphatically Nature's scavengers, and faithfully do they perform their work. But it is the vegetable eaters with which we are more directly concerned; and here also we see a beautiful and wise arrangement in this work of demolition.

The chief organs of plants (of the Phenogamia) are the roots, the stems, the leaves and the fruits, and a glance at the habits of the insects we have described, will show that each of these organs has one or more groups, adapted in a peculiar manner to its destruction. The Melolontheans and Elaters, in the larva state, live al-

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most exclusively on the roots of grasses and other plants. In fact, the larvae of the Melolontheans by their shape are peculiarly adapted to their mode of life and the food on which they exist. Being compelled to feed sidewise or upwards, their form is not adapted to crawling, but their natural position is on the side.

The Buprestians and the Capricon-beetles are the stem-eaters, and the telescopic ovipositor of the latter group is adapted to their mode of life; with it they can place their eggs far into the chinks and crevices of the bark, out of the reach of wind or storm, or other enemies. Their larvae need no feet in their secret burrows, along which their roughened segments can draw them as they slowly penetrate the solid wood. The ant and the well-digger have to bear away their chips and clods, but the borer makes food of its chips and casts them behind it as it moves on. The Chrysomelians are the leaf-eaters, with brilliant colors suited to their gay life on the leaves, basking in the bright rays of the sun. And lastly, the Curculios are the fruit-eaters, with their long snouts easily piercing the fleshy pulp or hard rind, within which the larvae live out their days, with abundant nourishment ever at hand.

These mighty armies, often of countless multitudes, compared with which the armies of Napoleon or of our Union sink into insignificance, if left unchecked at their work of destruction, would soon lay our forests in ruins, and sweep from the earth its green carpet. But Nature's God holds a check in his hands, and at His will turns loose upon them an army of fierce destroyers, an army that can follow them, not only through the open air, but to their subterranean habitations, their wooden burrows and their most secret hiding places. Then let us study these things, although minute in size, and feeble, singly, yet their united efforts are often astonishing. And though we may spurn one or crush it with our heel, the multitudes defy us. By them the hopes of the fruit-growers may be blasted, the forests scorched as with fire, the wheat fields rendered worthless, and the farmer's bright anticipations cut short. Then let us study them; God's laws are made in wisdom and mercy, and for the evil there is a remedy—if we will but search faithfully we may find it out.

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ORTHOPTERA.

This order, as has been before intimated, contains those insects that are known by the common names of grass-hoppers, Devil's-horses, walking-sticks, cockroaches, crickets, etc. The word *Orthoptera* signifies straight wings, and is given to these insects because their wings when not in use are folded lengthwise in straight folds, like a fan. These are covered by a pair of veined, leathery, semi-transparent wing-covers, generally long or oval. The body is generally long and comparatively narrow, in some, however, as the

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Cockroaches, it is broader and depressed. They are biting insects, furnished with corneous lateral jaws or mandibles. Most of the species are furnished with ocelli or eyelets. The antennae are often very long and thread-like, composed of a great number of minute joints. The larvae are similar in shape to the perfect insects, but are smaller and are without wings. The pupae are active, and do not cease eating, they have rudimental wings. All the species known are terrestrial, that is, none are aquatic; and most of them are vegetable eaters. The order is far less extensive than the Coleoptera, and, as at present arranged, is divided into six different families, of which I will speak in their order. The number of species determined that are found in Illinois amounts to about fifty, which is probably three-fourths of the entire number to be found in the State. As I have studied this order more attentively than any other, I hope that no objections will be made to taking rather more latitude in introducing species, which, although not very injurious, are interesting not only to the naturalist, but readers generally. And what is now written will save writing it hereafter, for the day is not far distant when there will be a demand for a complete list and description of all known species inhabiting our State. The order has been arranged as follows:

First Section.—Cursoria. Consisting of the single family, *Blattidae.*

Second Section.—Raptatoria. Consisting of the single family, *Mantidae.*

Third Section.—Ambulatoria. Consisting of the single family, *Phasmidae.*

Fourth Section.—Saltatoria. Consisting of the three families, *Achetidae*, *Gryllidae*, *Locustidae.*

Belonging to the first section or family, *Blattidae*, the Cockroaches, although individuals, are abundant, we have but few species. And I shall content myself with describing the species most common in the southern part of the State.

Blatta pennsylvanica, DeGeer. Length to the tips of the elytra about one inch, width of the thorax, one-fourth of an inch. The head, around the base of the elytra, whitish; a broad, dusky stripe down the front; antennae long, filliform, dusky. The thorax rounded, slightly broader than long, depressed at the sides; surrounded, with the exception of a small space behind, by a wide, semi-transparent, whitish border; the central brownish portion is somewhat six-sided. Elytra or wing covers somewhat transparent, outer border one-third the width, pale, clear whitish, inner two-thirds a coffee color, or pale rusty; the nervures of the outer border run diagonally back and outwards, while those of the other portion are directed backwards and inwards. Wings as long as the elytra, transparent, with slightly fuscous nervures.

This very common species, that invades our houses, attacking cold victuals in the cupboard and pantry, is too well known in this

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section at least, to require any further notice. Dr. Harris says that he believes our indigenous species are found exclusively in the woods; but this species, although breeding under bark, and in old stumps and logs, penetrate into dwellings after night, often in considerable numbers. They are especially fond of recently papered walls, eating the paste; they also are fond of milk, biscuits, etc. The more widely known Oriental roach (*Blatta orientalis*) is also found in our cities. These, when very troublesome, are generally destroyed by poison of some kind mixed in dough, meal, or some such preparation.

The *Mantidae* are carniverous insects, preying on flies and other soft-bodied species. These are known in some places as "Devil's-horses," although this name is in other places applied to different insects. The only species found in Illinois, with which I am acquainted, is the *Mantis carolina*, Linn. This is about two inches long, of a pale purplish color; with a very short and broad head; a long, naked, cylindrical thorax, nearly three-fourths of an inch in length. Wing-covers semi-transparent, mottled with purple, about a third of their length, from the base near the outer margin, is a small, black, circular spot. Fore legs strongly spined, and adapted to holding their prey. A variety (or sex, according to some) is a pale yellowish-green throughout, except the black spot on each elytron. This I take to be the female of the male just described.

Belonging to the next family, *Phasmidae*, we have two or three species, one of which is the well known strange insect with a stick-like body; three inches or more in length, about the size of a rye straw, without wings. It is the *Spectrum femoratum*, Say, *Bacunculus Sayi*, Burm., and *Diapheromera Sayi*, Gray.

Achetidae.—This is the cricket family, with the wing-covers placed horizontal and overlapping each other; the antennae are long and tapering; the feet (except one genus) three-jointed; the body furnished at the end on each side with a straight, tapering process; the females mostly furnished with long, spear-pointed ovipositors. Most of the species are vegetable eaters, and some quite injurious.

The common mole cricket (*Gryllotalpa brevipennis*, Serv.) is probably found here, but I have not yet met with it. Neither have I seen the *G. longipennis*, Fitch, which is found in Arkansas, or the *G. borealis*, Burm., found in Maryland. I think, beyond a doubt, one or more of these species are to be found in Illinois.

Tridactylus Illinoiensis. New Species. The antennae dusky; the upper lip and lower front of the head black; between the eyes a paler fuscous, with a round, blackish spot on the apex. Thorax a dusky brown, marked on each side, chiefly on the posterior half, with a large darker spot which is narrowed in front and bifurcate behind. The elytra about half the length of the abdo-

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men, pale on the upper edge and dusky on the outside and at the tips, with a darkish spot on the outside at the base, fading towards the middle. Wings extending over one-fourth of their length beyond the abdomen, smoky. Anterior legs yellowish or white; middle legs white at the base and tips of the thighs and tibiae, and marked with a broad, black band across each of these parts, occupying more than half their length. Posterior thighs length of the abdomen, white, with two broad, blackish, brown bands across them. Length, to the tips of the wings, three-eighths of an inch; to the tip of the abdomen, five-sixteenths of an inch.

This singular genus of insects is distinguished by having the anterior tibiae broad and garnished on the under edge, with strong spines; the posterior tarsi are wanting, or rather are replaced by long, movable appendages, which are straight, and fringed with fine hairs. This species is abundant throughout the State, living in the soft sandy banks of branches or other streams, close to the water. Here their little holes may often be seen in great numbers, from which individuals of all ages will emerge if the earth is forcibly pressed. While walking along the banks of the river I have seen them by hundreds leap on to the water, along which they float for an instant, and then spring back on the bank. They have a singular enemy, the last we would start in pursuit of such active little creatures. It is the *Galgulus oculatus*, belonging to the Bug tribe, shaped almost exactly like a soft-shelled turtle, with short legs, short bill or rostrum. But nature has adapted it to its work, being exactly of a mud-color, quite flat and lying close to the ground, it moves slowly along without being perceived, when close to its victim, with a sudden upward and forward leap it grasps the unsuspecting cricket with its fore-legs and plunges its beak into it. Such is our little insect's enemy in Southern Illinois; in Northern Illinois Mr. Walsh does not appear to have found the Galgulus, but he has found the cricket, and wrote me sometime since that he thought it a new species. We also have another species of this genus, which is common throughout the State, the *apicalis*, of Say. I have retained the generic name given by Olivier, in preference to the *Xya*, of Illiger, or the *Heteropus*. Palisot-Bauvois.

Acheta abbreviata, Serv. Is a common black cricket found under logs and in holes in the ground. From three-fourths to nearly an inch in length. Wings and elytra short, not reaching beyond the fourth abdominal segment. This is the statement of Serville in his description; and, although we have those here that agree with that description, I find a number of individuals that would, without close examination, be placed in that species, not differing

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those entomologists into whose hands this paper may fall, I ask: Can this be the *Gryllus carbonarious*, Serv.? (Orthop. 335.) Although that author says it is unknown from what country his specimen came, yet it agrees in description with our insect. I find, since writing the above, that Burmeister has named this species *A. pennsylvanica*, yet I think it is the *carbonarious*, of Serville.

Although Dr. Harris, in his work on "Injurious Insects," (page 132, Ed. 1852,) states that "we have no house crickets in America; our species inhabit gardens and fields, and enter our houses by accident;" yet I am satisfied, by ocular demonstration, that we have a house cricket. And that is not all, it is the same as the European house cricket, no less a personage than *Acheta domestica*, Linn., and may be found around the hearth at almost any time.

The *Acheta nigra*, Harr. A little black cricket about two-thirds of an inch in length, and with very short wings, is also found in Illinois.

The foregoing species reside on the ground, hiding during the day under logs, bark, in holes and such places; they are not gregarious. But there is a social species, found here in considerable numbers, in the fields and along the roadsides. This is the *Nemobius vittatus*, Harris. It is about four-tenths of an inch in length, of a dark brownish color, with a black stripe along each side of the thorax and wing-covers, which on the thorax is margined by pale, dusky stripes. Posterior thighs very large, paler than the thorax.

We have another species here, found on trees, though by no means abundant, that I am inclined to think is a new species, at least I cannot find that it has been heretofore named. It does not agree in characters with either *Nemobius* or *Oecanthus*, but comes nearer Serville's genus *Podoscritus*, but as my specimens have been badly damaged, I will give a short description without attempting to place it in its proper genus, until I can get better specimens. It varies in size from three-eighths to half an inch in length. Head as wide as the thorax in front; antennae long and very slender, basal joint enlarged, sub-cylindrical, inserted close together. Thorax about as long as wide, narrowed in front, very hairy, it and the head a dirty ochre color, the thorax more of a yellow, having on each side an obsolete dusky stripe, probably sometimes wanting. Elytra (of male) covering the abdomen, rather broader in the middle, rounded towards the ends, of a dirty ochre color, with occasional dusky points near the margin; the margin, from the base entirely round, is a distinct, yellowish white border. Posterior legs very long, equaling twice the length of the whole body, tibiae and femora about equal length; tibiae straight, with rows of movable spines, between which are smaller ones, apparently not movable. Anterior tarsi very short, the posterior (wanting except first joint) has the first joint very long, armed at the extremity with two spines, the inner being the larger. Wings about same length as elytra. This description taken from the male. The general color

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throughout is a dull, ochreous, the white elytral margin being conspicuous. Until an older name is found we may call it *Acheta marginata*. I have found the few specimens taken, on the locust and walnut trees.

Oecanthus niveus, De Geer. This is the "white climbing, or tree cricket." The body is about half an inch long, to the tips of the elytra, three-fourths of an inch. It is of a creamy white throughout, except the underside of the abdomen, which is dusky. The antennae long and slender; the head sometimes is tinged with pale red. Thorax narrow and longer than wide; elytra (in the male) considerably widened behind, clear, transparent, three diagonal cross veins on the upper one. Wings not exceeding elytra in length. In the female, the wing-covers are narrow; the ovipositor dark, and reaching to the tips of the wings. Posterior legs long, the tibiae very long and slender. The males utter a very shrill sound, and when numerous, as is often the case, their "shrilling" equals that of a choir of small tree-frogs. I have found them in the latter part of summer abundant on blackberry bushes and walnut trees, the latter appears to be a favorite resort. Salvi, in speaking of the habits of the *O. pellucens*, says the female pierces the stems or branches of certain vegetables to the pith, and in each nest deposits two cylindrical eggs. That they complete their last change about the middle of August. In Southrn Illinois they appear in the perfect state about the first of August.

The little spotted wingless cricket found under stones and logs, to which Dr. Harris gives the name of *Phalangopsis maculata*, certainly belongs to the *Raphidophora*, of Serville, and is the *R. lapidicola*, of Burmeister and of Haldeman, in Stanbury's Report. This would place it among the *Gryllidae* and not the crickets.

The family *Gryllydae* contains those grasshoppers with four-jointed tarsi, long, slender antennae, and in which the female has a long, sword-like ovipositor or piercer. The species generally reside on grasses, shrubs or trees, feeding on the leaves of trees or on the grasses, among which they are found. Although several species of this family are found in Illinois, I will only glance hastily over the descriptions of one or two of the most injurious and abundant species.

Xiphidium fasciatum, De Geer. (*Orchelumum vulgare*, Harr.) General color glassy-green, varied with dashes or spots of dark brown. Antennae exceedingly long and slender; the face sloping obliquely backwards towards the breast, lower part of a greenish-yellow, with a stripe of the same color extending up the front. A blunt tuburcle extending forward between the antennae at base; a smooth brownish stripe along the vertex. A broad, double brown stripe along the top of the thorax, paler in the middle, fading behind. Sides of the thorax, and cheeks glassy green. Wing-covers (of the male) transparent green at the sides and tips, with a yellow nerve on each side; the top of the upper elytron at base, smoky,

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with four black points, two at the base and two farther back. Hind legs very long, the thighs reaching nearly to the tips of the wings and wing-covers, which are nearly twice as long as the abdomen. The abdomen of the female, brown, the egg-layer or piercer bent, and over half the length of the abdomen. The abdomen of the male, green at the sides, reddish-brown above. Length, to the tips of the wing-covers, from one inch to one inch and a quarter. These insects are very abundant during the summer and fore part of the fall on grass and weeds, in the fields and gardens. The males being very noisy, often of warm nights chirping close to your window until midnight, apparently doing their utmost to keep you awake. And if they happen to get into your room they act as though their only business was to make a noise. Another species similar in appearance, but smaller and darker, is found in the meadows and fields in considerable numbers. It is the *X. agile*, De Geer. (*O. gracile*, Harr.) To what extent these two species are injurious, is difficult to ascertain, as they do not appear in such excessive numbers as to defoliate the plants upon which they feed. I think the chief injury they do is weakening plants or grasses on which they feed, by eating portions of the young and tender blades and leaves. The loud notes of the cheerful katy-did are as well known throughout the region where it is found as any other forest sound. And although the insect is somewhat shy, it is too well known to require a lengthy description. Length, to the end of the wing-covers, about one inch and three-fourths; and across the wing-covers, at the widest part, is three-quarters of an inch. It is green, with a large vein running along the middle of each wing-cover. Dr. Harris says it is the custom of the female to shave off the bark of a twig, and then deposit thereon her slate-colored eggs, overlapping each other like shingles on a roof. I have known them to come into the house and deposit their eggs on the smooth frame of a looking glass. This is the *Platyphyllum concavum*, Harris, *Sperspicellatum*, Fabr., and I think the *Salvifolium*, Licht and Brullé. We also have another species similar in shape, but having the wing-covers flat and not concave. It is often over two inches long to the ends of the wing-covers. It is the *Phylloptera oblongifolia*, De Geer. Another species similar in coloring and shape to these, is quite numerous here. It is about one inch and a half in length, to the end of the elytra or wing-covers, which are narrow and of even width nearly their whole length. This is the *Phaneroptera angustifolia*, Harris, *septentrionalis*, Serv., *curvicauda*, De Geer, *myrtifolia*, Drury. These three species have the wing-covers strongly reticulated, giving them a slightly roughened appearance. I will notice one other species and then leave this family. *Conocephalus ensiger*, Harr. The body is about one inch long; to the end of the elytra two inches. It is of a pretty pea-green color, with the head pale or whitish. The upper lip often red, and sides of the mouth yellow;

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eyes dark; a conic projection extends forwards between the antennae; and is green above and below, with the under edges black. Lateral edges of the thorax marked with a yellow line on each. Wing-covers a uniform green, long and narrow, fully twice the length of the abdomen. The piercer or ovipositor of the female is nearly straight, and as long as the abdomen. I am of the opinion this is the *C. dissimilis*, notwithstanding Dr. Harris says "it appears to be different." A specimen I have before me, sent to me by Mr. Walsh, exactly agrees with Serville's description, while other specimens from different sections vary somewhat in their markings. The two authors have described different varieties of the same species. If I am wrong in this opinion, then the specimen received from Mr. Walsh is certainly the *dissimilis*, for it agrees with the lengthy description of Serville in every particular, who describes both male and female, and tells us he had four specimens of the two sexes, from Latreille's collection, and marked by the latter as received in North America.

Although some species of this family are often quite numerous, and all feed on plants, yet the injury done by them is not great, or at least is not very apparent. As before remarked, in regard to certain species, it is probable the greatest injury they do is to weaken plants and retard their growth by eating portions of their leaves and blades. As the remedies applicable to the species of this family, are equally applicable to the next, I will pass on to that, and speak of the remedies at the close.

Locustidae, (Leach.)—This family is historically more noted than any other in the whole insect class. As far back as the days of Moses and Herodotus we hear of the devastating Locust of the East, and of the armies of "winged-serpents." And, according to Serville, nearly every ancient language had a peculiar name for these insects, derived from some habit, or applicable to some effect produced by them. Thus the Hebrew name signifies *to multiply;* the Greek name signifies *extreme* or *highest point*, "because," as the ancient authors say, "these insects inhabit the tops of the mountains or the tops of plants." They certainly were not very well acquainted with the habits of the insects they were speaking of. The Latin name, *locusta*, is derived from two words signifying a "burnt place." The Sanscrit name signifies *to leap;* the Chinese name, *the marching worm*, and the Arabian and Chaldean name, *to eat.* Notwithstanding the renown of these insects is as ancient as the Pyramids of Egypt or the stories of the Illiad, the passage of their name across the Atlantic, to the New World, has shifted it to other wings. And now the Cicada of the Greek and Latin poets is compelled to bear the hated name, *Locust.* The Cicada, whose ringing notes disturbed the quiet Virgil, as he sat beneath the "spreading beech," dreaming over the travels of his Trojan hero; the Cicada, whose voiceless females furnished illustrations for the sarcastic verses of the Rhodian bard, here, in the

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land of "Young America," lose all of their poetic renown, and are compelled to bear the name that brought terror to the Israelites, and spread gloom and darkness over the face of the farmer of the Old World.

But let us drop this strain and proceed with the work before us. The species of this family are distinguished from those of the other families of the order, by their shorter antennae; the tarsi are three-jointed, seen from below appear four-jointed. The females are destitute of the piercer or ovipositor found in the two preceding families. They are the insects to which the name "Grasshoppers" is applied in common parlance. They are the insects to which the name "Locusts" has been given on the Eastern Continent, and which name should be applied to them here. This name, as above stated, has been given to a species of *Cicada* belonging to a different order. A name is a mark placed upon a thing whereby it may be known, and if the same mark is placed on different things, there is confusion, and the progress of knowledge is obstructed. Let us then learn to call these things by their true names, and not transmit from generation to generation the same error.

Opsomala punctipennis, Serr.; *brevicornis*, Linn.—General color pale or yellowish green; face sloped very obliquely under, towards the breast, triangularly pointed between the antennae; eyes long ovoid; antennae dusky, broadest near the base, tapering, not longer than the thorax; head greenish yellow; thorax flat and compressed at the sides, lateral angles sharp, and a middle rib or elevated line; elytra narrow, longer than the abdomen, green, with a yellowish vein on each, with a few dusky points scattered along the middle and near the tips; legs green, tibiae sometimes dusky, posterior legs long, the thighs exceeding the abdomen in length. This is the female: length to tip of the wings and wing-covers nearly one inch and a half. The male is much smaller, being very narrow and compressed, and only one inch in length to the end of the wings. The entire flat sides from the eyes to the ends of the elytra are a dusky brown. This species appears to be confined to particular spots, their favorite haunts appearing to be grassy spots along the low banks or margins of branches or small streams; and it must be a spot where but few weeds are intermixed, and where the rays of the sun during the hottest part of the day can fall upon it. I have found them in but one place in this neighborhood, on a little grassy plat, containing less than half an acre, where season after season I have procured specimens in abundance. They reach the perfect state about the last of July or first of August. The males are exceedingly active, springing rapidly over the tall grass, accompanying each leap with a series of sharp sounds very similar to that of the crackling of fire in stubble.

O. bivittata, Serv.—Green, varied with dusky stripes; the frontal cone is more obtuse than in the last named species; lower part of the face yellow, upper part of the face and sides of the head green-

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ish; a buff stripe, bordered with dark green, along the top; the thorax brownish above, darker towards the prominent lateral angles, and paler along the middle; sides green, with a black stripe along the middle of each; elytra as long as the abdomen; a green ray along the inner margin, reaching half way back to the tip, where it fades to a pale smoky color; along the center is a dusky ray, small at the base, gradually expanding and growing paler until it spreads over the whole width near the tips; the anterior submargins deep green; the anterior and middle legs and posterior tibiae and under side a dark brown; posterior thighs green on the outside; the length to the tips of the wings a little over one inch and a quarter. This description applies to the female. Although Serville gives the length at twenty lines, this evidently is the same species. The male he appears to have been unacquainted with. I have some individuals that I am satisfied are males of this species. A little less than one inch long; of a brownish color, striped with deeper shades of greenish and dusky. This species is very rare in this section. So far, I have taken but two females and three males. They are found in grassy fence corners and yards, where the blue grass prevails.

Acridium.—Is the name of a genus containing several of our most injurious and common species of locusts (grasshoppers,) and is generally distinguished from other genera by the robust body and spine on the front breast; elytra usually the length of the abdomen.

Acridium americanum, Drury; *rusticum*, Fabr.—Are ochre-yellow, with reddish-brown stripes and spots; antennae yellow, face and stripe on the top of the head yellow; from the lower angle of the eye, extending down each cheek, a dark brown tapering stripe; thorax projecting behind in a blunt angle; a yellow stripe along the middle, meeting the stripe on the head, the remaining portions on the top of the thorax brown and rough, the sides yellow, with two short, brown stripes on the middle; the elytra and wings extending beyond the abdomen, the former yellowish, with reticulated black patches or spots that increase in number and size towards the tips, the inner borders yellow, which, when closed, make a yellow stripe along the back; wings transparent, with the anterior longitudinal nerves black; legs yellow, posterior ones very long and stout, the thighs with a row of black dots along the margins, and a dusky line along the center; knees black, and tips of the spines on the tibiae black; length of the female to the tips of the wings, two inches and a half; of the male, about one inch and three-fourths. Of this species we have two varieties, one that appears about the first or middle of August, that is of much deeper red or rather vermilion color, having the spots and marks the same as the one described, but the legs very pretty vermilion, and all the other parts, except the yellow stripe along the thorax and wings, assuming the vermilion tinge. The other is the one de-

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scribed, which appears early in the summer. The larvae and pupae of this species differ as much from the perfect insect as a cow does from a horse. The species I described as No. 8, undetermined in my paper on the Orthoptera of Illinois, published in the third volume of the Transactions Illinois State Agricultural Society, is the pupa of the *Americana*. I there say it does not appear to have passed through its moultings.

This species is sometimes so abundant as to prove very injurious to growing crops, especially the fall brood or variety, filling the air with their silvery wings as they fly from point to point. Its flight is strong, apparently, being able to remain on wing for a long distance. This species is not only congeneric with one of the destructive Asiatic species, but is very closely allied to it, being similar in size, in coloring and even to the reticulated black spots on the elytra. The species I allude to is the *A. peregrinum* of Olivier, which author (Voyage dans l'empire Othoman-tom 2, p. 424) speaking of this species, says he on one occasion in Syria saw an innumerable quantity of these insects moving along in regular flight, accompanied with a loud noise, covering the heavens and shutting out the rays of the sun. In a moment afterwards the fields, the roads and houses were covered with them, and in two hours afterwards every plant was stripped of its leaves. If the two species are so nearly related, we have reason to be in constant dread lest the restraining hand may be lifted, and this fearful scourge let loose upon us, to convert our broad prairies into barren deserts. The same united causes that swept the sand over the once rich plains of Assyria, may drive the sands from the west over the Mississippi Valley. And I am of opinion that the vast swarms of grasshoppers we hear of in Utah and the far West belong principally to this species, though Professor Haldeman, in Stansbury's Report, expresses the opinion that they belong to *œdipoda corallipes*. This species (*Americanum*) does not, as I am informed, inhabit the northern part of this State; how far it reaches north of this section, I am unable to state.

A. bivittatus, Say; *milberti*, Serv.; *femoratus*, Burm.; *flavovittatus*, Harr.—Head, body and legs of a greenish yellow, with a reddish tint, and often brownish spots. Region of the mouth pale or whitish; antennæ pale red. Thorax having a soft, velvety appearance, slightly elevated central line, three transverse incisions, a yellow marginal line each side; on each side of the thorax is a

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This species is numerous in the meadows and clover fields, especially in the latter, clover appearing to be a favorite food. They are fond of heavy clover, high grass or high weeds, avoiding bare and exposed places. They are also quite fond of horse radish leaves—not only eating the leaves, but also seeking the thickest bunch, in which they undergo their last moulting.

A. differentialis, Uhler.—General color an olive brown. The mouth and upper lip olive green; upper part of the head and antennæ reddish. Thorax with three distinct transverse indentations, which continue down the sides, the longitudinal line slightly elevated, interrupted at the indentures; of a nearly uniform olive green; latter half punctured. Elytra uniform olive brown, somewhat opaque at the base, transparent toward the tips; passing the abdomen but little. The wings transparent, the anterior longitudinal nerves black. Anterior and middle legs greenish red, posterior pair yellow, marked with black; the outside of the thighs, with the alternate converging rays of the disk, black, the lower margin reddish yellow, with a row of black points; the inside of the thighs partially crossed by three black bands; the knees, and a band near the upper end of the tibiæ, black; spines tipped with black.

Length of female, one inch and three-fourths; of the male, one inch and a half. The female of this species is the most robust grass-hopper we have—the posterior thighs being remarkably enlarged. This is the species marked "Locustidæ No. 5," in my paper before alluded to. As I then supposed, this was an undescribed species—having since been named as above, by Mr. P. R. Uhler, of Baltimore. It is fond of shade and high weeds, and appears to avoid thick grass. It is fond of mounting tall weeds when the sun is not very hot, and there slowly feeding, or remaining motionless, for hours.

A. spretis, Uhler.—General color a dark brownish purple, with dusky points and lighter rays. Head brown, with dusky points; antennæ reddish yellow. Thorax an ashy brown, with a velvety luster on the anterior half—the latter half punctured; the lower edges at the sides paler—sometimes pale red, at others almost white. Elytra extending about half over the abdomen, (or not exceeding two-thirds,) marked along their internal margins with a light reddish brown ray; external margin dusky; a few dusky points along the internal margins. Wings not quite as long as the elytra; transparent, pale yellowish on the disk, tinged with red at the base, (in recent specimens.) Posterior thighs crossed by two broad black bands, and black at the knees; intermediate spaces pale yellow, often almost white. Length of female, one inch and three-eighths; of the male, slightly over an inch.

This species is quite common here, along the road-side, and among low weeds and grass.

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A. femur rubrum, De Geer.—General color a dirty reddish brown. A black spot extending from the eyes along the sides of the head and thorax, and oblique yellowish line on each side of the body, beneath the wings. The elytra marked along the middle with a row of dusky spots. The posterior tibiæ red, with black spines. The wings are transparent, pale yellowish at the base; length from three-fourths to an inch.

This is probably the most common and generally diffused species found in the United States. It appears early, and continues through all the summer, and until late in the fall; and is a general feeder, and quite injurious, oftentimes proving very troublesome and destructive to meadows and crops.

As I have already extended this account of our orthoptera to too great a length, I will only describe one species of the very extensive genus *Locusta:*

L. viridifasciata, Harris.—Green; thorax keeled above; wing-covers with a broad green stripe on the outer margin, from the base beyond the middle, and including two small dusky spots on the edge; the remainder dusky to the end. Length about one inch; often a little over that length.

Opsomala brevipennis, (new species.)—Female—General color a pale green. Upper lip an ashen hue, with dusky points; face a uniform green; antennæ flat, not enlarged below; pale red, dusky at the tips, not longer than the thorax. A dark narrow margin along the under side of the lateral angles of the thorax; the remaining portions green. Elytra very small, not exceeding half the length of the abdomen; uniform green; wings nearly as long as the elytra. Abdomen dirty green above, and pale brown beneath. Posterior thighs long, green; knees black, shanks dusky. Length one inch.

Male—Very small and narrow, being only five-eighths of an inch long. The entire face whitish, or very light green. The sides of the head, thorax and wing covers dusky—in some parts black. Abdomen white beneath and black above. Wings and wing-covers not extending over more than half the abdomen.

From the great similarity in coloring and shape to the *O. punctipennis*, this might be taken for the pupa of that species; but the flattened antennæ place it in the second division of the genus, as established by Serville; and furthermore, I have frequently taken the sexes while copulating. It is found much more generally spread than the *punctipennis*, and is also more injurious.

Having given the descriptions of some of the more important species of the order, let us take a general glance at their habits, and of the best means of preventing them from injuring us. The *Gryllidae* and *Achetidae* demand but little of our attention, as the damage done by them will never amount to much. They have no species disposed to sudden and rapid multiplication; the only species at all likely to prove troublesome are those belonging to the

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genus *Xiphedium*. If they should at any time prove injurious to a meadow, I know of no better plan to meet the difficulty than by sweeping the field with sheets, or wide nets of some kind, and destroying those taken. They are active, and it will require some practice to catch them. Fowls are fond of them, as they are of all kinds of grass-hoppers; and where they can have the freedom of the fields and meadows, they will do good service in ridding them of these pests.

The family Locustidæ is the one that contains those species most to be dreaded, of which the most dangerous, in this State, are the *A. americanum* and the *A. femur-rubrum*. Hot, dry seasons being most favorable to their multiplication, they attack the crops, already weakened by want of moisture, and thus hasten their destruction. I am of opinion that, notwithstanding so much noise has been made over the "army worm," it has not done half as much injury for our farmers as these two species of locusts or grass-hoppers. The "army worm" but seldom makes its appearance in considerable numbers, and then remains but a few days; while the grass-hoppers are present every year, and continue to eat and destroy, as larvæ, pupæ, and perfect insects, from early in the summer until in the fall. And from various quarters, such complaints as the following come up to us, concerning the ravages of these insatiate myrmidons:

"In the first place, we had myriads of grass-hoppers, that did fair to devour every green thing before them. They came here first in August, 1857, in clouds, from the north-east, probably from Minnesota; and, after destroying everything of a tender nature, deposited their eggs in the ground, making it look, in some places, almost like a honey-comb."—[*Letter from Crescent City, Iowa, to the Prairie Farmer, August* 5, 1858.]

One of the editors of the same paper, writing from New York State, says, concerning grass-hoppers:

"I have never seen such flocks of these insects, or birds (for they fly in flocks, like birds,) before, as are devastating the north-western portion of this county, and the south-western part of Jefferson county. They eat corn—its foliage, silk and the ear; strip the potato of its leaves; cut off the wheat-heads, and eat the kernel; trim the oats of foliage, and relieve the head of its burden of grain. They are said to have eaten into onions—*actually eating the bulbs.—August* 26, 1858.

And, strange as it may seem, they, (*A. americanum*,) the au-

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"It is stated that in Maine, 'during *dry seasons*, they often appear in great multitudes, and are the greedy destroyers of the half parched herbage.' 'In 1749 and 1754, they were very numerous and voracious; no vegetables escaped these greedy troops; they even devoured the potato tops, and in 1743 and 1756, they covered the whole country, and threatened to devour every thing green."

The following account of the ravages of the *A. femur-rubrum* is taken from the travels of President Dwight, as quoted by the same author:

"Their favorite food is clover and maize. Of the latter they devour the silk, thus preventing the kernel from coming to perfection. But their voracity extends to almost every vegetable, even to the tobacco plant and the burdock. Nor are they confined to vegetables alone. The garments of the laborers, hung up in the fields while they are at work, these insects destroy in a few hours, and with the same voracity they devour the loose particles which the saw leaves upon the surface of pine boards, and which, when separated, are termed sawdust."

In addition to all this testimony concerning the ravages of these insects, I suppose every reader of this essay can add other similar facts that have come within his own knowledge. I may here add that the eggs are not always deposited in the ground, for I have frequently found them in the ends of old rotten sticks, under rails, chips, and various places of this kind. Those I have gathered are long, cylindrical and dull yellow, slightly enlarged in the middle, and often somewhat curved; one-eighth to one-fifth of an inch in length. These insects have several enemies that assist us in diminishing their numbers and saving our crops. Birds are very fond of them, one species in particular, (*Lanius borealis*) or the Butcher bird, taking delight in catching them and impaling them on thorns or the sharp splinters at the end of fence rails. Domestic fowls will also destroy a great many of them; Madam Dorking will race a large one across the largest yard before giving him up as lost. There is also the fly, heretofore spoken of, which darts upon his victim at the moment it alights, and holding it to the ground inserts his proboscis between the base of the wings and extracts the juices. I will here give a description of it, quoted from my article in the *Prairie Farmer*, correcting some mistakes therein: "Terminal style of the antennae setaceous, naked; tibiae not curved; first joint of the tarsi prolonged, pulvilli double; third joint of the antennae enlarged fusiform; thorax elevated. Of an ashy-purple color throughout, except the pulvilli or pads between the claws, which are whitish; thorax hairy; length about one inch and a quarter. I am unable to give the name of this insect. There is a sand-wasp that I observed the past summer carrying grasshoppers to its hole, but as I did not succeed in taking a specimen I cannot give its name or description. Dr. Harris says that they are subject to the attacks of certain thread-like blackish worms (*Filaria.*) I

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have frequently found a pale red mite on them, probably the same species spoken of by the last author. Their eggs, so far as known, have few insect parasites. I placed a rotten block, containing a number of eggs in the hollow end of it, on a desk in my office during the winter. It was forgotten, and left exposed there until the next summer, when happening to examine the place where it was laid, a number of young grass-hoppers were found lying dead around the stick, the eggs having remained undamaged by insects. I am inclined to think that ants occasionally destroy them, but of this I am not positive. Ordinarily the grass-hoppers select such ground as is not annually disturbed in which to deposit their eggs, as the fence corners, around stumps, and other protected spots, but if numerous they seem less particular. If any way could be devised to destroy their eggs, this would as a matter of course prove effectual. Catching with sheets, as before stated, will aid in this work, especially if done about the time they are pairing late in the season, as then the most taken will be females, the males dying off soon afterwards.

And before closing my remarks on these insects, I wish to say a word for the benefit of the writer of an article in the *Prairie Farmer*, (April 19, 1860, p. 242.)

That although re-writing what has already been well written may and is often profitable, the statement of facts that directly concern our farmers and the mass of our citizens, although written in the "*meanest style*," is certainly as profitable as repeating that which has been written and re-written for the last century.

HEMIPTERA.

This order contains those insects to which the name "Bug" is now properly applied. They are distinguished from other insects by having a horny, slender jointed beak for the mouth, with which they pierce plants or other insects and extract their juices. This instrument, when at rest, is bent under the breast. The larvae and pupae are like the perfect insect, former lacking wings and the pupae having only the rudiments. They are active in all these states, and continue to eat in all of them.

The order is divided into two well-marked groups, which by some entomologists have been raised to separate orders.

1st. The Heteroptera, or true bugs:

In which the wing-covers are thick and opaque at the base, but

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either entirely thin and transparent, or entirely of a thicker and somewhat opaque character. They are not laid flat as in the other section, nor do they overlap each other, but are more or less inclined at the sides. The beak issues from the underside of the head, close to the breast.

NOTE.—In the first division, *Corium* is the name applied to the thick basal portion of the wing-covers; the thin, transparent portion is called the *membrane.*

Galgupha flavo-marginata.—New species. Black, slightly bronzed; antennae dusky, five-jointed, the second joint very short; head punctured, two longitudinal indentations on the anterior portion; thorax large transverse, wider than the abdomen, convex, punctured; scutel oval, convex, covering the abdomen and elytra, except a narrow margin of the latter; a slight irregular depression each side of the base, punctured; corium, at base, and a narrow line next the membrane, black; the external margin pale yellow; membrane transparent; beneath, black with metalic lustre, except two irregular lateral spots on the breast, which are dull black and rough; length, one-twelfth of an inch. This little species has probably heretofore received a name, but if so I am unable to find it in any of the works that I have. It possibly may be the *Tetyra lateralis* of Fabr. (Rhyng., p. 142, No. 68., ed. 1803.) Since this was written Mr. Uhler informs me this has been named, but does not give the name. I have found this little insect in large numbers on various plants, especially the dock, sumac and may-weed. Whether it is injurious or not I am unable to say. The eggs are very large in proportion to the size of the insect, are of a lead color, ovate, placed on the end, the top opening with a circular fringe surrounding it of little spines. The larvae are bright red, with the head, feet and anterior portion of the thorax black. Its time of appearance is June, that is, arriving at the perfect state; it hybernates in the latter state.

Pentatoma bimaculata.—New species. Black, with red lines and spots; antennae black, first joint not reaching beyond the head, second, third and fourth about equal, the fifth and last longest and enlarged; head black, punctured; ocelli small, situated behind the eyes and near them; thorax large, elevated, punctured; lateral edges and the middle part of the front edge bright red; a bright red band across the transverse ridge, reaching the lateral rounded angles, curved forward at the middle; another longitudinal line of the same color crossing the last and extending from the front of the thorax to near its posterior edge; scutel very large, extending over two-thirds of the abdomen, punctured; on each side near the tip a bright red spot; hemelytra (wing-covers) punctured, edged in front with pale red; membrane transparent, with six or seven sinuous veins; extends beyond the abdomen; beneath, deep black; anterior tibiae with a single tooth on the underside below the middle; rostrum reaches the posterior legs; length one-

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fifth of an inch; near circular in outline. This species is very common here, especially on the mullein and other weeds. It is probable it has been described and heretofore named, and therefore I give this name temporarily. It is found during a good portion of the summer. Uhler informs me this has also been named.

Coreus tristis, DeGeer; *ordinatus*, Say; *rugator*, Fabr.—This is the common Squash-bug, so well known that any description might seem superfluous; nevertheless, that it may not be mistaken, I will give a short description, taken from Harris, Say, Fabricius, and a number of specimens, all of which are before me. Fabricius describes in a few words, thus: "Thorax not spined; body above entirely fuscus (dark brown with mixture of gray;) beneath mostly pale; feet variegated; thighs simple." Antennae four-jointed, of nearly equal lengths, the first and last joints being somewhat thicker than the others, they are not quite half as long as the body; blackish, head yellow; marked above with two black lines between the eyes; thorax narrowed in front to the width of the head, and as wide behind as the abdomen, and elevated; a slight transverse depression near the front margin; a very narrow lateral margin, each side yellow and not punctured, remainder thickly studded with large black punctures; scutel less than one-third the length of the abdomen, triangular, dark yellow, with black punctures on the central portion; from the outside of the base of each corium running to the anterior point of the membrane and meeting there, and being parallel to the sides of the scutel, is an indented line; this part of the wing-covers is the same color as the thorax, perhaps a little darker; membrane dark; beneath a dirty yellow with fine dusky points; legs dark, the posterior ones longest; no spines on either, and thighs not enlarged; its length is five-eighths of an inch, though some individuals among the males do not exceed half an inch.

These insects pass the winter in the perfect state, hiding in almost any place where they can find protection from the rains and storms. I have found them in stumps, under logs, rocks, planks, leaves, straw, and clods of dirt, in the cracks of fences, under weatherboards, on houses, in stables, barns and houses, and even in spiders' nests. Here they remain in a semi-torpid state, being easily revived by a little warmth. In this section they begin to lay their eggs on the squash and pumpkin vines, about the first of June, these are round, somewhat flattened, and of a yellowish green color. They are deposited in patches to the leaves, generally on the under side, but I have seen both sides as well as the stems almost entirely covered with them. From these the little rounded larvae are soon hatched, which at once plunge their beaks into the tender leaves on which they find themselves, and commence sucking the sap. And despite all your efforts to destroy or dislodge them, they seem to increase rather than diminish, until at last the plant, deprived of its nourishment, begins to droop and die.

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This is one of the worst garden pests that we have in the southern part of the State, and if I may judge from the complaints in our agricultural papers, our northern neighbors are no better off in this respect. There is no remedy more effectual in destroying these insects than picking them off and crushing them, or casting them into the fire or hot water, any way, so that after being caught they are killed. If they have succeeded in depositing eggs, the work is more difficult, and scraping these off or mashing them assists in injuring the plants; yet it is all that can be done, for washes and solutions do but little good. Kill the bugs when they first make their appearance, and you will have no eggs to mash, or young insects to contend with. Cultivate the plants well, and hasten forward their growth by all possible means not more expensive than the product of the ground is worth.

So much has already been written in the papers of this State concerning the Chinch-bug (*Macropus leucopterus*, Fitch,) that I shall pass it by in this paper without further notice.

Lygaeus succinctus, Linn.—Dull black, with pale red margins. Antennae four-jointed, first joint longest and the third the shortest; the first joint nearly twice the length of the head; whole length equal half the body; black. Head triangular, dusky, eyes globular, shining black, situated on lateral tubercles. Thorax slightly elevated, narrow in front as the head, widened behind; a faintly impressed transverse line before the middle; dull black, with the posterior and lateral margins striped with reddish-yellow. Scutel and elytra dull black, punctured, a tolerable broad yellow stripe extending along the outer margins to the membrane, which is a deep velvety black. Beneath, black with a silky lustre, the edge of the abdomen yellow; legs black, except the basal halves of all the thighs, which are yellow; anterior thighs furnished with one or two spines on the under side near the tips. Length, half an inch; width, one-sixth of an inch. This species breeds and feeds on the Post and White Oak bushes, where I have watched them from the egg to the perfect insect. The larvae are bluish-black, with the marginal yellow stripes.

Phytocoris lineolaris, Pal. de Beauv. (*Capsus oblineatus*, Say.) —Color an olive brown, with dark spots and lines. Antennae four-jointed, the second joint longest, tapering to the tips, dusky. Head small, smooth, striped in front with white and brown, central stripe brown, on each side of which is a pale or whitish stripe. Thorax convex, olive-green, punctured, margined with black and white in front. Scutel small, triangular, dark, with two whitish lines forming a V. Elytra with a pale spot at the tip of the corium, at the apex of which is a black point. Membrane smoky. Beneath, dusky or blackish, the abdomen with yellowish stripe on each side. Feet pale, thighs annulated with dark or brownish rings. Length, one-fifth of an inch. This species varies considerable in coloring, some individuals being much darker than others. It is very gen-

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erally distributed throughout the United States, and in some places has proven quite destructive, especially to the potato crops. And as early as 1851, we find notice of a belief that these insects were the cause of the potato rot. In the Buffalo *Commercial*, of June 29th, 1858, is an article advocating this same opinion, and giving an account of some experiments made by a Mr. Henderson with this insect.

He says the eggs are deposited on the tubers of the potatoes, to which they are firmly fixed by some glutinous substance. When deposited he does not say; but says that the egg is of an oblong form, and is planted with the seed potato, and they may be hatched in six days in a warm, moist place. The egg being hatched, the young insect remains in the ground during its preparatory state, stinging the tuber with its rostrum, "each perforation poisoning the root and beginning the rot." But another part of Mr. Henderson's statement is very inconsistent with the habits of insects, and will require demonstration as proof. "While yet in the ground, and as early as the tenth day of existence, the young insects cohabit, and from the great rapidity with which they propagate, Mr. H. argues that the eggs are deposited before the first emergence from the ground." Now, if the insects reach their perfect state in ten days, the above may be true, but, that they cohabit in the larva or pupa state, and deposit eggs in either, can hardly be correct.

Mr. Henderson suggests the propriety of sprinkling quick-lime over the potatoes as they are cut for planting. This species is very numerous in this section, being found everywhere and at all times of the year; it is in the fields, in the gardens, along the roadside on plants, shrubs, etc. I have found it in mid-winter, late in the fall, early in the spring, and at mid-summer. Therefore, it is well to watch its operations and if its injury is being felt the suggestions of Mr. Henderson should be attended to and carried out, they may be worth trial. The perfect insect, when that state is reached, leaves the ground and attacks the vines, thus assisting to complete the work of destruction begun under the ground.

Belonging to the *Homoptera* I will name two or three species and leave the order.

Cicada septemdecem, Linn.—The "Seventeen-year Cicada." This is the insect to which the name "Locust" has been so improperly applied in this country.

The perfect insect is from one inch and a half to one inch and three-fourths to the ends of the closed wings; when the wings are spread they expand from two and a half to three inches. It is of a black color, the wings and wing-covers transparent, the latter a little smoky near the base and tips and along the veins, the largest of which, near the base and along the outer margins, are orange red. The eyes are a bright red. (If these insects are allowed to remain some time in strong alcohol, they will retain their colors, even to the eyes.) They made their appearance (in 1859) in

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Jackson and the adjoining counties about the 18th of May, and continued to come forth until the 25th or 26th of the same month; the males appearing in advance of the females. Mr. Carpenter, of Union county, says they commenced boring and splitting the limbs on fruit and forest trees the first of June. He says they checked the growth of small trees, but killed none. Although they may not kill young trees "stone dead," yet I know a small orchard that had been planted out in 1858, that now has nought but deformed trees in it, and all their deformity resulting from the work of the *Cicada* of that year. And not only are they deformed, but their growth has been so retarded and their general health has been so materially injured that they will never be made to produce good fruit; and my advice to the owner has been to remove them and plant healthy trees.

Jassus inimicus, Say.—Body pale, with a yellow or greenish tinge; head, with a black dot each side on top; the front with cross, dusky interrupted lines. Thorax with a transverse curved series of about four dusky points on the anterior margin. Scutel has a short black line each side at the base. The elytra semi-transparent, with brown nervures near the suture and a few dusky spots; there are four terminal cellules, and three adjacent discoidal. The upper side of the abdomen has the next to the last segment yellowish; beneath, yellowish. The posterior tibiae double spined, with the anterior angle also spined or hairy. The beak three-jointed, middle joint large. Length, about three-twentieths of an inch. The hind legs are considerably elongated, which enables them to make considerable leaps. Mr. Say, in speaking of this species, adds, that the larvae are said to depredate upon the roots of wheat. I have found a considerable number of these insects in the young wheat after it had come up late in the fall season. At this time they do it considerable injury by puncturing the mid vein of the leaves, or the main stems, and sucking out the juices, that portion above the puncture soon dying. And if the young also attack the roots in equal numbers, we may well count this among the more injurious species. They pass the winter in the perfect state in the fields, hopping out from their hiding places when a few warm days come, if the ground is clear of snow. We also have a number of species belonging to this section closely allied to the last named, that are more or less injurious, some attacking one plant and some another. Passing through a meadow or stubble field thousands can be seen flitting before us and lighting on the grass stems or stubble, mostly with their heads down. Some are very minute and somewhat gayly colored, green, yellow and brown prevailing.

The *J. seminudus*, Say.—Is of a yellowish-white, head rounded in front; thorax obsoletely spotted with greenish; elytra white, with a broad brown band across the middle. Length, one-fifth of an inch.

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J. clitellaria, Say.—Pale yellow; head with two black dots before and a broad black band at the base; latter part of the thorax black; elytra black, with a yellow spot on the middle of the back. Length, one-fifth of an inch.

Tettigonia mollipes, Say.—Body yellow. The head is pointed and elongated in front. Beneath the eyes a brown line; thorax green, lateral margins yellow; elytra green, nerves pale, tips pale yellow; and a narrow line from the shoulders to the inner margin, yellow. Length, to the tips of the wing-covers, one-third of an inch.

These three species are very common in the fields and along the fence corners, the first preferring low shrubbery; but what particular plant either one prefers I am unable to say.

With this I shall close the list of insects I intend giving in this paper. I had intended extending it through all the orders, but I find it will be entirely too lengthy, and moreover, I am not prepared at this time to do this.

GENERAL REMARKS.

In giving the foregoing descriptions I have necessarily traveled over ground that has often been trodden before, and repeated much that has already been more than once repeated. But the object I have in view is to place before the farmers, gardeners and fruit-growers of Illinois short and plain descriptions of the most injurious species of the orders named, that are found within our State, and with which they are most likely to come in contact. Many, and in fact most of these species, are found in the Eastern States, where they have been heretofore studied and described. But the works in which these are to be found are not very generally distributed. Then I ask the readers and those to whom this paper is submitted, is it wise to throw aside all this valuable information for fear of repeating what has been already written, and devote our time, attention and pen only to such species as are new and perhaps far less important? The agriculturists require the entomologists of Illinois to determine the species found here, and post them as to what is already known of them, this will be a foundation upon which they can jointly add stone after stone as they are quarried from the great mine of unwritten insect history. Mr. Walsh has begun the work, what he has written is known to be applicable to our species, that need not be re-written; I have herewith added my mite; and although I have poorly repeated what has in a great part heretofore been written, yet I hope I have done one thing useful. I have made it applicable to ourselves.

The naturalist having described a species, the reader looks anxiously for a detailed and effectual method of checking and exterminating it. But, as Dr. Harris has well remarked: "The province of the naturalist consists in examining the living objects about him with regard to their structure, their scientific arrange-

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ment, and their economy or history. In doing this, he opens to others the way to a successful course of experiments, the trial of which he is generally obliged to leave to those who are more favorably situated for their performance." It cannot be expected that any one entomologist will have the means at hand or the opportunity of experimenting with the various species he may describe, as to their action on the various plants on which they depredate. This requires an accumulation of facts often accidentally becoming known, that may be gathered by the thousands of observers throughout the land. A single letter from a farmer in Iowa has brought before the public more information in regard to the habits of the *Polygramma* 10-*lineata*, that preys upon the potato vine, than all that can be gathered in regard thereto from a wagon load of entomological writings. The accurate account rendered by Mr. Hall in regard to the *Coptocycla bivittata*, or "sweet potato beetle," is worth more than all that has been heretofore written in regard thereto. Then let all interested follow the advice given to our fruit-growers. Let them pen down such facts as they ascertain in regard to each injurious species, and preserve a few individuals of each in as many stages of their lives as they can procure; and ere long there will be such an accumulation of facts as will enable the naturalist to give a complete history of each, and suggest the best remedies within our power to apply.

There are several different classes of remedies advocated by writers and experimenters. Thus, on the Eastern Continent, and to a certain degree in the Eastern States, gathering and destroying the insects and the eggs appears to be a favorite remedy. This, if complete, will undoubtedly prove successful. But in Europe labor is cheap, land and its products are very valuable; and there the agriculturist may go to an outlay to do this that would exceed the entire value of a similar crop in Illinois. And even in the vicinity of our large Eastern cities this plan may do. But can an Illinois farmer give ten dollars an acre to save a crop of corn that will produce fifty bushels to the acre, and worth perhaps only fifteen cents per bushel? This is an age of dollars and cents, and the cost must be counted. Nevertheless, I do not say this as an argument that this plan should in no instance be adopted, for in many cases it is the best one to resort to.

Solutions, washes, plugging, fumigating and similar direct applications are favorite remedies with many writers and individuals, and are principally adopted in some sections. In vegetable gardens, nurseries, graperies, hot-houses, etc., around our large cities, these may be successfully adopted. But what will they effect in the broad fields of corn and wheat of Central Illinois, especially where water is to be economised?

Another class urge the fact that each injurious insect has its parasites, that will, if introduced and multiplied, annihilate these hordes of destroyers. This is true, nature has provided checks and

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counter checks. But how is this to be done? What is the talisman of power that will enable us to work this wonderful change? It is as easy to gather our insect enemies one by one and destroy them as it is to gather one by one their parasites. But more of this hereafter.

And lastly, there are those who rely most upon preventatives by a certain system of farming or procedure. Such as cleanliness, burning, certain times for planting, rotation of crops, etc. And this I admit has been my hobby.

But to this, as well as to the other plans, a host of objections are raised or may be raised. Scrape, and clean, and burn, until the whole face of the earth is as clean as a Sunday suit, and all your efforts destroy only the eggs within your reach and such insects as hybernate in the perfect state, and with these you have destroyed an army of insect friends that would have done you good service. And when the following spring and summer roll round, earth yields a bounteous supply of fresh miscreants, ready for plunder and fearless of their few enemies that remain, while beneath the sod the hordes of subterranean myrmidons, unscathed by the cleaning fires, work unmolested.

"What then are we to do?" Your question is a fair one; and I will try and give you an answer. First, do not expect to rely exclusively on either method, for each may, and often does prove ineffectual.

When we have obtained a complete knowledge of the laws of nature, and shall have attained to perfection in agricultural pursuits, then most assuredly our reliance for a check upon these insect enemies will be upon the parasites a kind Providence has provided for our benefit. And the reason for so doing will be that then we will work in accordance with the laws of nature which are adapted to our best method of living and acting. Then if this theory be true, the nearer we can approach such a condition, individually or collectively, the better it will be for us.

How to do this is the difficulty; and, although touching somewhat on ground already occupied by friend Walsh, I will give my notions as to what is the best plan to be adopted, having previously touched on the same subject in the *Prairie Farmer*.

I have in the first part of this paper spoken of the effect the entry of civilized agriculture has had upon the insect world. And Mr. Walsh, in his essay, has spoken of the natural distribution of insects and plants, and its effects. Now, bearing these in mind, let us see to what they point, both as to the effect of our present system and the remedy.

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one entire timothy meadow, in a few years, if one or two dry summers were to follow in succession and somewhat weaken the vigorous growth of our virgin soil, we should see such swarms of grasshoppers as would equal those of the Old World. If it were made one vast garden of Roses, ere long the rose-bug would appear in countless myriads; and so on, with any given species of plant that has an enemy that is easily multiplied. Then the habit our farmers have of growing one kind of grain or other product for successive seasons in one large field is one means of multiplying their insect enemies. And as our State is not diversified by hill and dale as some other portions of the country, but is one almost uninterrupted plain, therefore are we liable to an increase of the evil in a proportional degree. And the facts, if gathered within our own borders, will show this to be true; for in the extreme southern portion of the State, where there are forests and hills and small farms, insect enemies have (with a few exceptions) never been so troublesome as in the prairie portion farther north.

Then let the farmers cut up their fields and diversify them with different crops, and adopt a proper system of rotation, let them not rely upon any one product. The practice of risking a year's labor and expenses upon the success of a single production has been carried to excess, and should cease, the crop may fail or the price fall, and all this toil and labor is lost. Of what use are thousand acre fields of corn to the Central Illinoisan, when ten cents a bushel is all he can get for it, even with a good crop? Let the prairie farms have groves and belts of timber planted here and there over them; not of some fancy species, but of the various native species found in and adapted to that section where they are to be grown. Go to the nearest forest, see what are the different species found there, and the comparative number of each, let this be the guide; and from these select and plant, or grow them from the seed in nurseries, any way, so good and healthy trees are obtained. Do not plant each kind in squares or circles by itself, but mingle and mix them as near as possible as they are in the forest. No money will be lost by this, for the timber in a few years will be worth as much as all the crops raised from the ground they occupy would have been; and the protection the remaining portion of the farm receives will be worth still more. I often see in the papers complaints that insects are destroying the shade trees around the yard, or along the lanes; this is to be regretted, but it may be these trees are saving the orchard, and that for their destruction you are receiving a rich return of fruit. Why can't the various members of our Horticultural and Pomological Societies when they meet together, each bring a written statement of the position, history and every particular in regard to his orchard. These need not be published, but by comparing these together important facts might be obtained; and the point to which we have been directing attention, so far as it concerns orchards, might be determined.

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And here I would suggest something further for our fruit-growers on this point. Would it not be well to intermingle the various kinds of fruit trees they desire to grow, and also, here and there, in the midst, plant a forest tree? Which latter, as a matter of course, must not be allowed to attain too large a size.

In addition to what has been recommended to the farmers, let them raise sufficient stock to be in proportion to the size of their farms. Not of one kind, but of the various kinds; and do not forget fowls, they are useful if not directly very profitable, and in the end may prove to be worth more than what they sell for. Let the birds go unmolested, or even go so far as to entice them to abide near you. Learn to distinguish insect enemies from insect friends, and when you find the hiding places of the latter, as far as possible, protect them from injury. When you find a swarm of "Lady-bugs" huddling around the root of a tree in the winter, throw a few dry leaves over them that the birds may not see them. When you see the eggs of the Syrphus fly lying singly among those of the Aphis, do not molest it, for the young larvae will surely destroy that nest. And when the bright banded flies hover like bees around you, during the hot days of summer, while resting beneath the shade, brush them lightly away, and remember they are your friends. And when you see the eggs of the Lace-winged fly (*Hemerobius*) mounted on their long stalks on the leaves of your plants, let them alone, the voracious larvae they produce will soon destroy the most numerous colony of plant lice.

And thus, by a combination of these means, we may bring ourselves as near to the plans of nature as it is possible for us to do until we are better acquainted with the laws of nature. And this you will perceive is a proposition combining two of the remedial systems before mentioned. But this is not intended as excluding the use of any other remedies; the circumstances surrounding each particular case must generally determine the local remedy most appropriate. It is difficult, if not impossible, to give any general rules for these that will be applicable to each case. This much can be said in regard to gathering and destroying injurious species: where you have failed to prevent their appearance, and they are already upon you, if they can be gathered and destroyed at any reasonable expense, it is undoubtedly the best plan that can be adopted. And the destruction of a horde one season may prevent their appearing the next. But simply driving them away with nauseous odors is too much like sending whisky into the country to prevent it being drank in town.

Although I have brought forward some objections to the cleaning and burning method, I do not wish to be understood as abandoning what I have heretofore said in regard thereto. Because I still think clean farming is one great preventative to the multiplication of injurious insects. I was showing the fact that each and all methods were more or less defective, and that implicit reliance

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on either one would bring disappointment. Carefully gathering and burning refuse matter, such as logs, stumps, etc., especially around the fences, will destroy a large number of such species as pass the winter in the perfect state, and seek such hiding places. This includes most of the injurious bugs, (*Hemiptera*), and also, a portion of the Chrysomelians, or leaf-eaters.

And in this connection I may state my reason for thinking hedges are not the best fences for the farmer.

As a general thing along a hedge-row the grass is allowed to grow up, live and die unmolested, thus affording a most excellent breeding place to various species of injurious insects, such as the Melolonthidae, grass-hoppers, etc. If the ground around the roots could be kept clean, and the grass prevented from accumulating and decaying there, then I think instead of being injurious they would be beneficial and useful, not only as fences but as hiding places for the nests of sparrows, and various other little birds that would destroy a number of insects.

Readers of such papers as this purports to be, often when they find a larva at work injuring some plant for them, are at a loss where to begin their search for it, and how to know it when they have found where it should belong. Now it is impossible to do more than give general directions on this point, and although you may not be able to determine the species to which it belongs, yet if you can ascertain the habits of some allied species of the same family or genus you are near enough. The same remedies applicable to one case are applicable to the other, as a general thing. There are occasionally wide differences in the habits of even congeneric species, but such cases are rare. Therefore, close attention should be given to our introductory remarks in regard to the larvae of the different orders, and also, to the remarks made in regard to the larvae of the different families. But in order to aid as far as possible I will here give some further directions on this point. Thus, for instance, a larva is found depredating upon the roots of grass, the inquiry is at once made, what does it belong to? Is it the larva of a Coleopter, Lepidopter, or a species of some other order? First, let us examine what kind of a larva it is, and take its description. Say that it is a thick, fleshy, whitish grub, with a tolerable small, dusky or dark head, thinly covered with short, scattering hairs, the latter segments being the largest, the terminal being the largest of all or quite as large, with a cross anal incision at the tip dividing it into two lobes; having only six small feet on the first three segments, terminating in a single claw; the body bent in a semi-circular form, and its usual position lying on its side. It cannot be a Hemipterous or Orthopterous larva, for they are like the perfect insects, and not worms. It cannot belong to the Diptera, they are smaller and are mostly without feet, having in many cases a fleshy head. It cannot belong to the Hymenoptera, because the larvae are generally footless, and the

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Saw-flies of that order, which are like caterpillars, have, in addition to the six regular legs, several fleshy pro-legs. Next we will try the Lepidoptera. The larvae of this order are long, cylindrical, composed of thirteen segments. Having six articulated and pointed legs on the first three segments, two on each; and two thick pro-legs on the last segment, and from four to ten on the intermediate segments. This will not do for our insect, consequently we turn to the Coleoptera, and, as a matter of course, to those families that depredate on grass roots, to-wit: the Elaters and Melolontheans (or the entire family Lamellicornia). The Elaters being long, slender, cylindrical, wire-like worms, without numerous deep cross indentations, our larva cannot belong there, but must be placed among the Melolontheans, with which it perfectly agrees, and to which it belongs. It is something after this plan that must be pursued to ascertain where a larva belongs. But sometimes there is great difficulty in placing larvae, as those of one order in some cases approach very near in appearance those of another order.

And I will here allude to one borer belonging to the order Lepidoptera, that depredates upon fruit trees, and may, without caution, be taken for the larvae of some Coleopterous species. This is the "Peach-tree Borer." *Aegeria exitiosa*, Say. The larva is a naked, soft, white, cylindrical grub, when fully grown measuring between half and three-fourths of an inch in length, and nearly a quarter of an inch in diameter. Head, pale red, marked in front with blackish. Tapers at the head and tail, intermediate segments of nearly equal size. It has six small feet near the head. These attack the roots of the Peach trees, thus weakening and finally destroying the trees. This species, when it arrives at the perfect state, instead of a beetle produces a moth, which is about three-fourths of an inch or less in length, with slender wings, and abdomen fringed at the tail. The male has the body steel-blue; eyes dark, thorax with two pale lines. The abdomen two slender yellow bands above. The wings transparent, with the veins and margins blue. The female is also steel-blue, with a purplish tinge; upper wings blue; inferior wings transparent.

It is a good plan, whenever any larvae are found doing an injury to any plant that is useful, to drop a few of them in a little bottle of diluted alcohol, mark the date and character of the injury on a piece of paper, and having fastened it to the bottle, lay them away. If this is done, a chance of finding the name and history of the miscreant, will come around after a while.

Although we cannot predict with certainty one season the action of insect enemies for the next, yet we often can from the character of the season itself, know that certain species are likely to be upon us in increased numbers.

This was the case the present season in regard to the appearance of the "Army-worm." The cold, cloudy spring hanging so long before opening into summer weather, caused the exclamation

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from several of our older citizens, "I wouldn't be surprised if we had the Army-worm this season." Although this was rather guessing, yet there evidently pervaded the minds of the elder settlers a semi-conscious feeling of dread in regard to this insect, which most assuredly originated from the similarity in this spring to the previous seasons when it had appeared. And when the long dry weather we sometimes have in June and July has parched the vegetation, we may expect the grass-hoppers to multiply rapidly, and by their attacks on the plants already struggling for life, to soon effect a far greater injury than the same attack made on vigorous plants would have done.

When the weather is very warm, cloudy and damp, or sultry, with considerable moisture in the atmosphere, then we may expect the Plant-lice (Aphides) to be troublesome; it is the kind of weather suited to their rapid development. Plants then should have as much air and sunshine as can possibly be given; extra and unnecessary leaves and limbs should be removed, so that the air may have a fair chance to circulate freely.

And perhaps I had as well here as hereafter say a word about the protection I spoke of giving predaceous insects, in order to secure their services. In yards, vegetable gardens and similar places, I have often examined beneath planks, slabs and such things that happened to be lying on the ground, and I have generally found it to be the case that those planks or slabs that lay flat on the ground, without any intervening grass, weeds, or other material, generally had beneath them one or several carnivorous ground-beetles and no injurious species of any order, in the perfect state. But under such as were thrown across a bunch of grass or weeds, together with the carnivorous species were to be found some individuals belonging to injurious species. I allude principally to the fall, winter and spring seasons. Now, taking a hint from this, would it not be well to try an experiment, where practicable, as in a garden or small nursery, and here and there in different places lay down a few heavy planks, or, what is better, slabs or puncheons, having cleared the grass and weeds carefully away, so that they might press directly on the earth. I am not aware that this has been tried for the purpose here mentioned, and cannot say what it will amount to. It might be tried by two or three persons having isolated gardens or patches adapted to the experiment. This method would at least protect these insects from the chickens and turkeys; and if we can afford them a protection which will not at the same time prove a protection to our enemies, then we have made one step towards the object we have in view.

As before intimated, Lady-bugs pass the winter in the perfect state, and are generally found huddled together in considerable numbers around the root of some large tree in a warm, dry situation. The *Hippodamia maculata*, our most common species, I have generally found around the roots of Oak and Sugar trees,

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partially concealed by the leaves and bark. Whether they prefer any particular tree or not, I do not know, but am inclined to think the protected and warm situation has more attraction for them than the particular kind of tree. The *Coccinella munda*, Say, I have found wintering singly under leaves in the woods. If these could be gathered in the winter or early in the spring, before the warm weather scatters them, they might be placed at such points as desired, by situating them as near as possible like they were in the place from which they were moved.

The very numerous tribes of Hymenopterous parasites are so minute, and of such habits, that it is, with our present knowledge, impossible to give any method by which they may be transported and multiplied at will.

And now, having taken up several more pages with this paper than I anticipated, although I have not advanced half through the work I proposed to do, I am compelled to bring my labor to a close for the present. If this should prove of any benefit to those for whom it has been written, I shall be satisfied, and not regret the time I have spent upon it. It is no easy work to write even so short a paper as this, when the facts known concerning our own insects, and upon which we have to build, are so meagre. If our farmers could have any idea of the aid a few words and specimens from each would be to the entomologist, it does seem to me they would listen to our oft repeated call. If what is here done should prove acceptable, I shall, if life and health is granted, continue it in the course of one or two seasons.

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INSECTS INJURIOUS TO VEGETATION IN ILLINOIS.

By Benjamin D. Walsh, of Rock Island, Illinois.

It is not very long since Dr. Fitch, the Entomologist of the New York State Agricultural Society, referring more particularly to the depredations of certain new enemies which had attacked the wheat plant in the Eastern States, expressed his opinion that in the matter of Insects the year 1861 was the most extraordinary year on record.

We may safely say the same thing, as regards the State of Illinois. The old stereotyped enemies of the farmer—the Hessian fly, the wheat midge and the chinch bug—have done us this year comparatively but little damage. But several other insects, which have never hitherto swarmed generally throughout the State, have in 1861 appeared in such numbers as to injure our crops most materially.

First. The insect known as the "white grub," and which is most probably the larva of the beetle commonly called the "May-bug," (*lachnosterna quercina*,) has in many localities so completely eaten away the roots of the grass in tame meadows, that the turf will peel off as if pared with a spade. In other localities it has worked in great numbers upon small grain, corn and young trees, cutting away and devouring the roots of the living plant, so as to check and stunt its growth, and sometimes even to kill it. Although this insect has, always existed here in comparatively small numbers, yet until this year it has never, so far as I know, been anything like so numerous. In all probability the perfect "May-bugs" will make their appearance in great swarms in May and June, 1862, wherever the larvae have been numerous, and destroy the foliage of our fruit trees.

Second. Another somewhat smaller species of chafer (*lachnosterna pilosicollis*, of Say,) is recorded as having swarmed by thousands in the perfect state at Pana, in May. It destroyed the roses, leaf and bud, and nearly finished the raspberries, and is also said to have been hard on vines, peach trees and maples. The larva of this insect has, no doubt, similar habits to those of the "white grub; but, as is often the case with insects that work underground,

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its ravages seem to have passed unnoticed. I am not aware of this insect ever before appearing in such numbers in any part of the United States.

Third. The larva of a small moth, which I have not as yet succeeded in raising to the perfect state, occurred in great numbers in June, from one end of the State to the other, scooping out the buds of mossy roses, so as to leave nothing but a hollow shell. I could meet with but one man who had ever noticed it before this year, and then only in very small numbers. Judging from its habits, it seems closely allied to the European *Argyrotoma Bergmanniana*, and may prove identical with that species. It has been extensively destroyed by a small Ichneumon-fly.

Fourth. The larva of a small moth, belonging probably to the group known as "leaf-rollers," (*tortrices*) has occurred by millions in McHenry county, in stacks of clover-hay, late in December. It is stated to be found not higher up in the stacks than two feet from the ground, and to prevail quite generally there. In consequence of the silken cocoons spun by it, previous to passing into the pupa state, the hay becomes one tangled mass of webs, and cattle refuse to eat it. So far as I can discover, no such insect was ever before noticed in such a situation.

Fifth. Never until this year was the army-worm known to swarm in Northern Illinois.

This list might be enlarged; but the instances quoted are sufficient to show that the equilibrium of insect life has this year been greatly deranged. It may take some years before the relative proportions of the various species of insects become re-adjusted to their normal state; and if so, we may expect similar phenomena in 1862. Early in the spring of 1861, from having noticed many species of insects abundant near Rock Island, which I had never previously met with, I predicted "that we should this year find insects swarm that were never even noticed before, and other insects which are ordinarily plentiful almost entirely absent." (See the *Prairie Farmer*, of June 20th, page 396.)

With regard to the last of the five insects enumerated above—the well known Army-worm—as the conclusions I have arrived at respecting its Natural History have been disputed by certain writers, and as the remedy based upon those conclusions has been stigmatized as delusive—I propose now, at the risk of some repetition, to show that my views are correct and my remedy a true one. To prevent misunderstanding, it will be as well to state that

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localities. Probably I may have under-estimated the number of such exceptional cases. But be that as it may, it must be evident, that if only *one-half* of the annual crop of army-worm's eggs are deposited in tame-grass meadows, it is an object of great national importance to know how to get rid of that half. The magnitude of the pecuniary interests involved, must serve as my apology for recurring to a subject which has been almost written to death.

It is not, I believe, asserted by any one that the Army-worm moth never deposits its eggs in tame-grass meadows; but Mr. Cyrus Thomas, who formerly believed that the insect produced two broods every year, the last of which lay in the pupa state till the following spring, has now relinquished that belief, but still maintains that the first and only brood passes the winter, as a general rule, in the pupa state, and that the moth does not come out to lay her eggs till early in the spring; consequently, that burning meadows in the winter cannot destroy eggs that are not laid till the winter is over. Others again seem to be of opinion that the eggs are laid almost indiscriminately—sometimes on tame grass, sometimes on fall grain, sometimes on spring grain, or on corn.

In answer to the first objection, it will be sufficient to state that I myself had five army-worm pupae in July, all of which developed into moths the first few days of that month, except one, which I killed for a specimen; that Col. Dougherty, of Union county, had two pupae, both of which hatched out some time in June or July; and finally, that Dr. Bartlett, of Pesotum, had forty-four pupae, every one of which hatched out the same summer. This makes a grand total of *fifty pupae*, some from Union, some from McLean, and some from Champaign county, *every solitary individual of which* hatched out from the pupa the same summer that they hatched out from the eggs. With such facts as these before us, no rational entomologist can any longer maintain that the normal habit of the army-worm is to hybernate in the pupa state.* The great majority must necessarily become moths some time in June or July; and although it is not very improbable that one in fifty or one in a hundred may be unhatched till the following spring, yet there is as yet no satisfactory proof of any such fact.

As to the theory that the eggs of the army-worm moth are laid promiscuously, sometimes on tame grass, sometimes on fall grain, and sometimes on spring grain or corn—let us look a little to the question of dates. Those that were bred by Mr. Cyrus Thomas, in Southern Illinois, hatched out from the pupa the latter part of June; those that I bred myself, from larvae obtained in Central Illinois, hatched out about about the first week in July; and near Rock Island, in Northern Illinois, what I have no doubt were army-worm moths, were seen by Mr. Wm. Harold, on the 6th day

*Fuller details on this subject will be found in an article of mine, in reply to Mr. Thomas' paper on the subject, which is printed in the *Prairie Farmer*, of December 5, 1861.

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of July, on a piece of fall wheat, along with which timothy had been sown, the larvae having disappeared, according to his private diary, on the 20th of June. On the whole, we may safely assign June and July as the months in which the moths make their appearance—earlier in the southern part of the State, later in the northern part.

Now, nobody has ever seen army-worm moths actually at work laying their eggs, and nobody is very likely to see them; for, as they fly chiefly by night, the probability is that they deposit their eggs by night. In the absence of positive testimony, we are therefore driven to have recourse to certain general rules, established by Naturalists from observation of the habits of a vast number of different species of insects. On the principles of the Inductive Philosophy, we are, of course, entitled to assume, until the contrary is shown, that what is true of all allied species of insects whose habits have been accurately studied, is true also of the army-worm moth. The rules with which we are now more immediately concerned, are these:

First. Every insect takes its origin from an egg, generated by the perfect insect. In some few cases, as with a species of blow-fly, and also, as I am informed, with the fly which produces the well-known maggots in the heads of sheep, the egg is retained within the body of the mother until it hatches; and in a very anomalous family of two-winged flies (*Hippoboscadae*) the egg is retained until it becomes a pupa. But no such fact has been observed in any of the moths, and we may therefore safely assume that the egg of the army-worm moth is deposited somewhere in the egg state.

Second. Every insect deposits its eggs in such a situation, and with such precautions, that they will, as a general thing, remain alive until they hatch out, unless destroyed by violence. The instincts of insects in attaining this end form one of the most instructive and amusing chapters in the great Book of Nature. Without such instincts, implanted by an all-wise Providence, no species could propagate itself from year to year.

Third. Every insect has the remarkable instinct to deposit its eggs in such a situation that the young larva, as soon as it hatches out, will have at hand a supply of its appropriate food. The perfect insect may feed on the honey of flowers; the larva on the leaves of some plant; but the eggs are not deposited on the flowers, but on the leaves or twigs of the plant. Eggs that produce dung-feeding larvae are laid in dung; eggs that produce carrion-feeding larvae in carrion; eggs that produce wool-eating larvae in wool, and so forth. If, on the contrary, eggs that produce dung-feeding larvae were dropped at random upon the leaves of plants, and eggs that produce leaf-eating larvae in dung or carrion, it must be manifest that the great majority of the newly-hatched larvae would starve before they could find suitable food, and the species would soon become extinct.

Applying these general principles to the case of the army-

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worm moth, it must be evident that its eggs can only be deposited on those plants upon which we know that it naturally feeds, viz: timothy, red-top, blue-grass, wheat, rye, oats, corn, etc. But it was shown before that the moth makes its appearance in June and July, and at this period, and for a considerable time afterwards, there is no fall grain sown, much less out of the ground, and spring grain and corn must of course be out of the question, as they are not sown till the following spring. Neither, on the other hand, is it reasonable to suppose that the moth would, as a general thing, lay its eggs upon annual plants, such as corn, wheat, oats, etc., which are coming to maturity the same season. For its instinct will teach it that there is no certainty of their being succeeded by the same crops the next spring, which is the time appointed by nature for the egg to develop into a larva. Even if it did deposit its eggs in such localities, they would be buried by the plow, and rot, except under very peculiar circumstances, long before hatching time. On freshly plowed ground the moth would certainly not lay its eggs, for there would then be nothing to attach them to, and no means of protecting them from the inclemency of the winter. It would seem, therefore, to follow, that as a general rule, the moth, during June, July and August, must lay its eggs upon timothy, red-top, blue-grass, or some other perennial plant, which not only affords a suitable nidus for its eggs, but which it instinctively knows will, the following spring, afford a copious supply of green herbage for the future larva.

Exceptional cases no doubt occur, but they are the exception and not the rule. A careful examination will show, that in many instances, where the army-worm was believed to have bred in small grain, it had, in all probability, bred in tame grass meadows, and traveled from them on to the small grain. It is so natural to suppose that an insect breeds where one finds it, even when its migratory habits are notorious, and so little attention is paid by farmers to the habits of noxious insects, especially in their earlier stages, that it is no wonder that erroneous ideas should prevail on such subjects. We were told not long ago, in the columns of the *Illinois Farmer*, that the Illinois army-worm would not touch the cotton plant. We now learn from a statement in regard to cotton growing in Illinois, published by the Illinois Central Company, that Apollos Cooper, of Jackson county, planted a piece of cotton on the first of May, and was obliged to replant the last day of May, *because it had been cut off by the army-worm.* Few are aware how carefully it is necessary to sift all evidence on scientific points before it is finally received as trustworthy. "Just as the infant's eye," says Mr. Carpenter, "has to be trained to distinguish forms and distances, so it requires practice before we know how to see truly an object that lies before us. During the educational process it is often *very easy to see what we wish or expect to see.*"—[Smithsonian Report, 1860, p. 231.] Even in matters which are perfectly

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familiar to the popular mind, popular opinion and popular evidence are notoriously fallible. The uncertainty of the verdict of a jury is proverbial, and every one must have noticed in the courts cases where witnesses of undoubted veracity, and with no conceivable motive for falsehood, swear right in one anothers' teeth as to transactions which they have all seen with their own eyes.

One case where I can conceive it to be not improbable that an exception to the general rule may occur, is where a field of grain has shelled out badly before cutting, and been plowed shortly after cutting. There will then start up immediately a more or less heavy growth of grain, upon which the moth might deposit its eggs. If, as is generally the practice out West, the next crop is put in with the harrow, without any second plowing, many eggs might escape destruction and hatch out at the usual time in the spring. Again, the southern extremity of Illinois is a timbered country, and, so far as my observation extends, the grasses common on our prairies do not grow there. I am not botanist enough to say what species of grasses do naturally come in there upon cleared land, but, whatever they may be, it seems that army-worms eat them as readily as tame grass, which they will not do with the native prairie grasses. Mr. Thomas mentions an instance where a piece of vacant ground in the town of Muphysboro, that had been inclosed in March, 1861, had numerous army-worms on it in the following spring; and he tells us, also, "that he knows of some instances where grassy fence corners assisted much in causing wheat to be overrun by them." Hence, in some cases, in Southern Illinois, it is evident that army-worms may take their origin, not only from tame grass, but from patches of this volunteer grass, of which there may, perhaps, be several distinct species.

Again, I can suppose it to be perfectly possible, especially in the northern part of the State, where the moths do not appear till towards the end of July, that the lives of a good many may be prolonged till the fall grain is sufficiently started for them to lay their eggs on. I heard at the State Fair of a case where a piece of wheat, sown towards the end of August, 1860, immediately before a rain, and which consequently came up shortly after sowing, swarmed with army-worms in 1861, although there was no tame grass anywhere in the neighborhood from which they could have

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meadows for them to breed in. * * * Wheat and grass sown in the spring are exempt until the worms reach them from some other field. In 1857 and 1861, where there were old meadows, they bred in them and destroyed them, while new meadows, or those of the previous falls' sowing, escaped."—[*Prairie Farmer, December* 26.] It is *possible*, in fact, that the life of the army-worm moth may be prolonged regularly, in every part of Illinois, till an advanced period in September.

Authors generally lead us to suppose that the life of an insect, after arriving at the perfect state, is exceedingly brief—say a few days or a few weeks only. Westwood mentions it as a remarkable fact that an individual dragon-fly should apparently have lived the "considerable period of several weeks."—[*Introduction II, p.* 37.] And Dr. Harris states, in general terms, that the adult state of most insects "lasts only a short time." I have been long inclined to suspect, for various reasons, that the life of insects in the perfect state, is generally under estimated by entomologists. The evidence on the subject, however, for want of accurate experiments, is not as satisfactory as it ought to be made.

What may be the average duration of the life of the army-worm moth, we have scarcely any definite information. From the analogy of allied species, I should not think it could generally exceed five or six weeks, or at the most two months. Mr. Lord, of Pesotum, as I learn from Dr. Bartlett, noticed them in great numbers flying about the wood-pile at the railroad station, for a period, as near as he can recollect, of about —— weeks. After the majority had disappeared, he found many at the bottom of the wood-pile, in moist places under chips and sticks of wood, apparently in a dormant state. They were capable of flight, however, when stimulated or worried. Probably they had retired there to die, for it is a peculiarity of almost all animals, and not exclusively of insects, to crawl into holes and corners to die. Dr. Bartlett himself, however, is able, by satisfactory evidence, to show that a single specimen was observed in the window of his house, in a sluggish state, so late as the 5th of October. It is, of course, uncertain, whether this was an individual which, as is sometimes the case with certain allied species, had remained in the pupa state beyond the normal time, or whether, having developed at the normal time, its life was abnormally prolonged.

In addition to the considerations referred to above, there are other reasons which induce me to think that the Army-worm moth cannot, *as a general thing*, deposit its eggs upon fall grain:

First. It seems tolerably well established by satisfactory evidence, that the army-worm did not generally damage the wheat and rye crop of 1861, except in a few cases where it cut off some heads of wheat. Now, if they had passed their whole larva life of four or five weeks in the wheat and rye, eating away at it while it was comparatively young, they must surely have damaged it con-

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siderably. On the other hand, if they migrated into it only for the last few days of their lives, when it was nearly mature, the trimming off the blades would injure it no more than it injures a crop of corn, when it is nearly ripe, to strip off the blades for fodder. It is remarkable that Mr. Geo. W. Ferrill, of South Pass, in Southern Illinois, states that in 1849, the army-worm, near him, *destroyed many fields of wheat entirely*, (*Prairie Farmer*, of Dec. 26,) and "I," of Marion county, says that he examined a field of rye in 1861, where it had "eaten out the grains, and the whole field was entirely worthless." (*Prairie Farmer*, of June 13.) In these two cases the insect had probably bred in the grain. The case of the damages done by it to the oat crop is governed by different principles; for oats, like red-top grass, it attacks by cutting off the heads so as to get at the stem.

Second. There are just as many assertions of the army-worm having originated in spring grain, especially oats, as of its having originated in fall grain. Now we know with certainty that the great bulk of army-worm moths make their appearance in June and July, and it is not impossible that the lives of some may be prolonged till fall grain starts sufficiently for them to deposit their eggs on it. But it is contrary to all experience and analogy that a moth should hatch from the pupa in June or July and live till the following April or May, so as to deposit its eggs on growing oats. If, therefore, a mistake has been made with respect to oats, it is not improbable that a similar mistake has in many instances been made with respect to fall wheat and rye.

Third. It has recently been proved that the army-worm is found in abundance in so high a northern latitude as the New England States, and has probably existed there for a century, occasionally appearing in great swarms, as with us, and being known by the popular name of "black-worm." In Northern Illinois it has never generally prevailed in great swarms until the year 1861. Yet wheat, rye and oats have been generally cultivated there ever since the country was settled; whereas, it is only within the last few years that the tame grasses have been much grown there. It seems reasonable to conclude, therefore, as the example of New England proves that climate can have nothing to do with the matter, that it is the introduction of tame grasses into Northern Illinois, to supply the place of native grasses that are gradually either fed out or plowed up, which has brought the army-worm there.

Fourth. There are certain counties, Henry county for example, where scarcely any tame grass is grown. In these localities it does not seem that any army-worms made their appearnce in 1861.

Fifth. Although there is considerable conflicting testimony, yet the great mass of evidence seems to show, that in general, where the army-worm has swarmed upon the cereal crops, there has been tame grass in the neghborhood, from which it might have traveled.

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In confirmation of the above assertion, I will quote the following cases, procured from various sources:

"My observation tallies with that of my neighbors, that the worm originated in the majority of cases in rye and wheat sowed in the fall. So far as I know, in every such case there was tame grass within half a mile; and the worms could have traveled from the grass to the grain in a few hours. I heard a neighbor say he encountered an army of worms some distance from his fields on a piece of unburnt prairie, and that he *naturally* set fire to the dry grass and destroyed them. I have myself seen them traveling on the prairie near wheat fields."—[*Letter from* Dr. BARTLETT, *of Pesotum.*

"So numerous are the army-worms in some places, that after having mowed down the meadows, they next attack the young corn, the wheat, and even clean the weeds before them. * * * They made their appearance about the last days of April, in the meadows, and grassy yards and plats. * * Having eaten out the meadows, and warm weather coming on, they began to travel from field to field, in some places causing the road to appear as a black moving mass."—[CYRUS THOMAS, *Jackson county, May 27th, in Prairie Farmer, June 6th.*

"In some wheat fields the army-worm is very numerous. * * They will injure our meadows, unless they do as they sometimes do—very suddenly and mysteriously disappear."—[EGYPT, *Union county, May 20th, in Prairie Farmer, May 30th.*

"The army-worm is stripping the meadows, late sown wheat and oats, and has made a destructive assault upon the corn fields."—[F. EVANS, *Jackson county, May 27th, in Prairie Farmer, May 30th.*

"At Audubon, the army-worms are reported as taking the meadows, and a farmer west of here told me yesterday they had attacked his wheat."—[GUS., *Christian county, June 3d, in Prairie Farmer, June 6th.*

"The army-worm has completely mowed all the meadows in this vicinity, and the wheat has not escaped them. Many fields have been stripped of every blade, and in some they have attacked the heads."—[A. P. CROSBY, *Marion county, May 30th, in Prairie Farmer, June 13th.*

"The army-worms are here by the millions, eating up meadows, oats and wheat. * * They have been here over ten days; I hear in some places that they have commenced on the corn."—[J. C. KENY, *Warren county, May 27th, in Prairie Farmer, June 13th.*

"The army-worms are slaying almost everything that happens to be in their route. They have ruined whole meadows of grass, and now they are taking the wheat."—[C. A. M., *Centralia, June 10th, in Prairie Farmer, June 13th.*

"Mr. Jennings has just burned over an 80 acre timothy field, which was literally covered with them. He has also had 80 acres

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of corn destroyed by them. They are attacking the wheat, eating off the blades and taking the kernels."—CUMBERLAND Co., *in Prairie Farmer, June 13th.*

"The army-worms are making havoc in this part of the State. Timothy and red top all eaten up, and some pieces of wheat are badly injured."—[I., *Marion county, June 6th, in Prairie Farmer, June 13th.*

"Army-worms awful, but much of the wheat so far ahead as to be out of their reach. Meadows (timothy) used up."—[C., *Marion county, June 5th, in Prairie Farmer, ibid.*

"We find the army-worm has appeared in some of the central counties of the State at various times during the last 26 or 27 years, and *always first attacking the oldest meadows of timothy.* * * Near Clear Creek, about fifteen miles west of Jonesboro, on the American Bottom, the worm made its appearance about three weeks since, in the timothy meadows, stripping them completely of their foliage. One gentleman, a Mr. McClure, estimates his loss of that crop at $4,000. *They have gone into the wheat fields and stripped the blades from much of that joining the grass,* but the berry is entirely uninjured. * * At South Pass the worm is reported as having attacked old timothy meadows and the corn to a considerable extent. * * At Centralia we hunted a considerable time to find a single worm where the grass had been entirely destroyed; the ground was entirely covered with their droppings. Their injury was confined mostly to timothy, blue grass and corn. * * In Champaign county, we visited a piece of timothy on the farm of J. B. Phinney, where they were first seen some ten days before. We found every stalk of timothy entirely stripped of leaves and head. *On one side of this was a field of wheat, in which they had advanced perhaps two rods;* on another was a corn field, into which they had advanced four or five rows, when a deep furrow plowed across it had entirely stopped their progress."—[*Editorial Correspondence Prairie Farmer, June 13th, in Prairie Farmer, June 20th.*

"One of our large cattle feeders told me yesterday the army-worms were on his farm, and had used up his meadows and pastures."—[B. S. P., *Logan county, June 11th, in Prairie Farmer, ibid.*

"The army-worm has made its appearance in great numbers in this county. They are also near Monticello, Piatt county. Meadows are being cut to prevent the worms cutting them."—[S. F. S., *Macon county, June 11th, in Prairie Farmer, ibid.*

"Army-worms are pretty bad, will destroy some meadows or

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this neighborhood, and, in every instance, they first originated or appeared in a field of rye." (Identified as army-worms by editor *Prairie Farmer*.)—[F. BEATTY, *Knox county*, *June* 18, *in Prairie Farmer*, *June* 27.

"One farmer hereabouts had a hundred acres of meadow taken by the army-worms; another two hundred, and another had sixty acres of corn totally destroyed."—[RYAN W., *Champaign county*, *June* 20, *in Prairie Farmer*, *June* 27.

"The army-worms have commenced their depredations, and are making a clean sweep of the corn and grass as they go."—[C. COOPER, *Washington county*, *June* 22, *in Prairie Farmer*, *ibid.*

"The army-worms injured the wheat some, and they also ruined the most of the meadows and some little corn."—[J. M. GLASCOE, *Milton*, *June* 22, *in Prairie Farmer*, *ibid.*

"Timothy and red-top meadows were nearly all ruined by the army-worms; ditching saved some of them."—[CLARK SELLERS, *Pike county*, *December* 2, *from Prairie Farmer*.

I obtained from Mr. C. T. Chase, at the State Fair, several specimens of army-worms, captured, as I was informed, in a timothy meadow, in Cook county, where they occurred in considerable abundance. The owner of the meadow informed Mr. Chase that he had noticed the same insect for a great number of years in the same situation, sometimes abundant and sometimes quite scarce.

"I first found the army-worms in a small piece of oats on a neighboring farm. They had then been there two days, and had mostly disappeared, having cut most of the grain from the stalk. * * * On examining a field of oats of my own, I could find none on the outer edge, but the center had been pretty thoroughly cut, and not a worm to be seen. This was on ground plowed in September. In pieces of meadow, both timothy, blue grass and prairie adjoining, there was no show of the worm. In another piece of oats, with clover and timothy on two sides, they had only been through the center, and one side, which was in wheat, (spring) stripping the leaves from two or three acres. This was fall plowed ground. No appearance of the worm in the meadows. From these facts I conclude they were hatched from eggs laid on the growing oats and wheat."—[J. C. ALLEN, *Stephenson county*, *November* 27, *from Prairie Farmer*.

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ground plowed August 1, 1860, and seeded to wheat and timothy September 16, 1860. The west half of this piece of ground had been in oats the preceding year, the east half in barley, and both timothy and wheat grew much ranker on the barley stubble than on the oat stubble. He first noticed the army-worms June 14, 1861, and they had all disappeared by the 20th. Immediately south of this piece of wheat was a piece of old timothy. When he first noticed the worms, they were some of them on the edge of the old timothy adjoining the wheat, but most on that half of the wheat which had formerly been in barley. But very few were to be seen on the part which had formerly been in oats. The new timothy was completely devoured down to the root, where the barley had been, but grew up afterwards. Mr. Harold himself thought that the worms must have bred in the wheat, but it seems far more likely that they bred in the adjoining piece of old timothy, and that they migrated thence into that portion of the piece of wheat where the young timothy grew so rank and fine. The night before they finally disappeared, there was heavy thunder, unaccompanied by rain.

Mr. Harold also informs me that about seventeen years ago the same worms were found in profusion, both on blue-grass, red-top and wheat, on a farm not far from his own. He saw them himself cross the road, as they left that farm for the bluff.

On the whole, it may be concluded, from a review of all the above considerations, that the army worm moth generally lays its eggs in tame grass, or on certain species of volunteer grass which occur in timbered countries; that it cannot lay its eggs on spring grain or corn, but that, under certain circumstances, it does lay its eggs on fall wheat and rye. If, therefore, every tame grass meadow in the State was burnt over this current winter, it must be evident that a very large percentage of these troublesome insects would be destroyed before they could hatch out, and a very large addition made to the aggregate wealth of Illinois.

PRACTICAL PROOF.

It will only be necessary, in conclusion, to re-state those cases where experience, the best of teachers, has shown that burning ground over destroys the eggs of the army-worm.

First. Mr. Wellington Wood, of Gallatin county, was burning brush heaps near his timothy meadow, and by chance letting the

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small portion of the field and burnt. The same field was again planted in wheat, and this season (1861) was overrun by the army-worm, except the burnt district, which they left untouched.—CYRUS THOMAS, *in Prairie Farmer.*

Third. At another place this spring, after the moth had made its appearance in a meadow, a portion of the meadow was burnt over by means of straw and dry grass. Soon afterwards the worms were hatched out in abundance over every part of the meadow, except the burnt district—there none were to be seen.—[CYRUS THOMAS, *in Prairie Farmer.*

Fourth. While I was attending the State Fair, I made the acquaintance of Mr. Rob. Dory, an intelligent fruit grower of St. Clair county, in the southern part of the State. Mr. Dory told me that he had for several years back been trying to persuade his neighbors to burn over their tame grass meadows every winter, not with any idea of destroying the eggs of the army-worm moth, but simply for the sake of facilitating the action of the scythe or mowing machine, the fire of course destroying the old "fuzz," which, as every mower knows, clogs up and dulls the edge of the scythe. This year he burnt his own meadow over, and persuaded one or two farmers in his neighborhood to do the same; and, just as I should have expected, THE BURNT MEADOWS HAD NO ARMY-WORMS ON THEM, WHILE UNBURNT MEADOWS ALL AROUND THEM WERE BADLY INFESTED. Mr. Dory could not recollect the precise month when the burning took place, but he thinks it was February. At all events, he says it WAS BEFORE THE FROST WENT OUT OF THE GROUND, and he very judiciously recommends that the operation should not be delayed till a later period, for fear of injuring the crop.

ROCK ISLAND, *December* 30, 1861.

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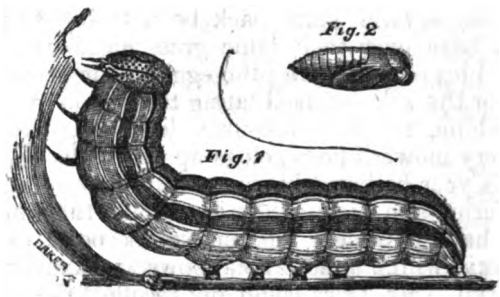
THE ARMY-WORM IN ITS THREE STATES.



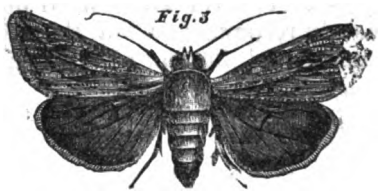


Fig. 1—Leucania unipuncta, (Haworth;) larva state.
Fig. 2—Leucania unipuncta, (Haworth;) pupa state.
Fig. 3—Leucania unipuncta, (Haworth;) imago state.

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PRIMARY AND SECONDARY PARASITES OF THE ARMY-WORM.

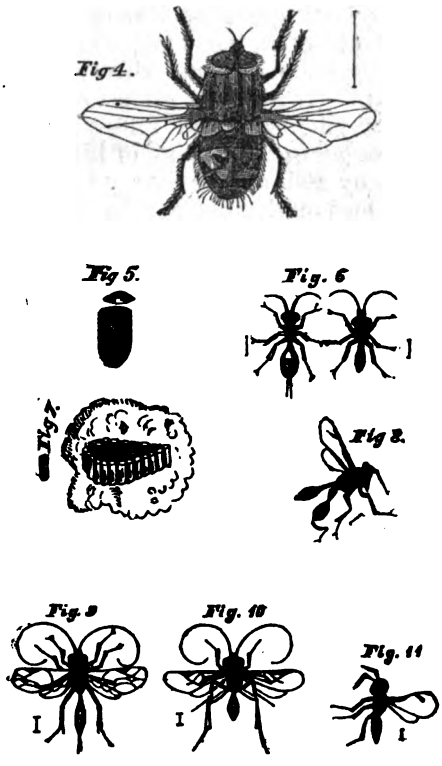

Fig. 4—Senometopia militaris. New species. Parasite of the Army-worm.
Fig. 5—Its puparium.
Fig. 6—Pezomachus minimus. New species. Parasite of the Army-worm.
Fig. 7—Mass of its cocoons.
Fig. 8—Chalcis albifrons. New species. Parasite of Pezomachus minimus.
Fig. 9—Mesochorus vitreus. New species. Parasite of the Army-worm.
Fig. 10—Microgaster militaris. New species. Parasite of the Army-worm.
Fig. 11—Glyphe viridescens. New species. Parasite of some undetermined parasite of the Army-worm.

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[The following articles were contributed, at the time of their date, by Mr. WALSH, for the "Journal of the Illinois State Agricultural Society." Their importance, it is believed, demands a place for them in the "Transactions."—*Sec'y.*]

THE GRAIN WEEVIL.

I have recently received several specimens of a small snout-beetle, about three-sixteenths of an inch long, which is stated "to have been produced from eggs among some wheat which came from the Patent Office last fall." It is a true grain-weevil—the *Sitophilus remote-punctatus* of Gyllenhall, and differs from the commoner European species)*Sitophilus granarius* of Linnæus) in being coal black instead of pitchy red, and in having fewer "punctures" or little pit-like depressions on the thorax. In Europe, where these two insects are common, and whence they were originally introduced among us, they do an immense deal of damage in granaries, each larva burrowing singly in a grain of wheat and gradually consuming the contents, just as the closely allied rice weevil (*Sitophilus oryzæ*, Linnæus) operates upon rice in this country, or as another species of the great weevil family, the common pea bug (*Bruchus pisi*,) operates upon peas. The mischief is frequently not discovered till the mature weevils begin to work their way out of the wheat, when the owner finds to his surprise, that what appeared at first sight to be good sound kernels are nothing but empty husks. Kirby and Spence were informed, by a man engaged in the brewing trade, that he collected and destroyed them by BUSHELS; and if they were allowed to increase and multiply undisturbed for any considerable time, it seems difficult to set any limit to their destructive powers, for it has been calculated that a single pair may produce in one year six thousand descendants.

Dr. Harris stated twenty years ago, that this same species was found in New York. It may probably occur in other parts of the United States, but as several other insects which attack grain are popularly confounded under the name of "weevil," it is often difficult or impossible to identify the culprit. For example: there is good reason to think that what in Central Illinois is known as the "red weevil," is nothing but the *wheat midge*, which is a two winged fly, belonging to the same order as the house fly and the mosquito, whereas the true *weevils* belong to the order of beetles and have all hard, shelly wing-cases, and long horny snouts.

Unlike the wheat midge, the grain weevils never attack growing crops. Their depredations are confined to the granary, but if they once get a start there, it is difficult to get entirely rid of them. I

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the gigantic grain warehouses at Dantzic, on the Baltic, men are kept constantly at work shoveling the grain from bin to bin; for it has been found, by experience, that frequent moving and exposure to the air checks the ravages of these insects. If the quantity of grain is small, kiln drying is the most sure and effectual remedy.

When we consider that three of our most noxious insects—the Hessian fly, the wheat midge and the bark louse—are not indigenous to America, but imported from Europe, it seems singular that so little care should be exercised by the authorities of the patent office in distributing imported seeds. Dr. Leconte states that one insect—a diminutive beetle called *Rhizopertha pusilla*—was introduced in specimens of wheat distributed from the patent office, and if the present system is persevered in, it may end in giving us some new noxious insect as destructive as the Hessian fly, or as troublesome as the house fly. Suppose a single pair of the European "Angoumois grain moths" were introduced into some of the enormous grain warehouses of Chicago, and allowed to multiply undisturbed for a few months! It might and probably would result in an annual loss to the State of Illinois of over a million of dollars.

Rock Island, December 14, 1861.

A NEW INSECT IN WHEAT.

When I was in Southern Illinois last June, I observed some curious facts respecting an insect which lives in the wheat plant. I am unable to give the complete history of this insect; but, as I am not likely to be able to perfect my observations, I have determined to publish them, imperfect as they certainly are, in the hope that other observers may thereby be induced to supply what is defective, and correct what is erroneous, in my statements.

While I was staying in Union county, Mr. Frick, the mayor of Jonesboro, was kind enough to take me to a wheat stubble, full of Hessian flies in the "flax seed" or pupa state, especially on the edge of the field, where the wheat was too poor to cut. I broke open a great many of the diseased straws, and found plenty of the pupæ, ensconced, as usual, between the shank of the leaf and the stem. To my great surprise, I also discovered several straws bulging out notably above one of the lower joints,

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as shown in Fig. I; and, on removing the swollen shank of the leaf, which is wrapped round the straw above the joint, I found that the straw itself was enlarged as shown in Fig. II, and often perforated by a hole of one-sixteenth of an inch in diameter. Inside the hollow bulge of these straws I found a bright, orange-colored, footless larvae, from three to four-sixteenths of an inch long, (Fig. III, sketched from memory,) which had no doubt bored the hole to facilitate his escape so soon as he should arrive at the perfect state. These larvae were not near so numerous as the Hessian fly pupae—being, perhaps, in the proportion of one to fifty. Having forgotten to bring my lenses with me from home, I was unable to examine them minutely, and a few specimens which I preserved, in order to breed the perfect insect from them, unfortunately died. Ten or twelve days afterwards, about the beginning of July, when I had received my lenses from home, I revisited the same field, but could not find a single specimen, although I searched diligently for that express purpose. Apparently they had all developed into the perfect state and "vamosed the ranch."

Now, into what perfect insect do these orange-colored larvae develop? They are certainly not Hessian fly larvae, for these lie not inside the stem, but between the shank of the leaf and the stem, sucking the sap of the wheat plant. Neither is it likely that they are identical with any of the "smooth, shining, footless little maggots of pale green and watery-white colors, commonly imbedded in wheat straw in small burrows or cylindrical channels which they have excavated," that are supposed by Dr. Fitch to change into certain two-winged flies, found by him in great numbers among growing wheat, and belonging to the group *Oscinides*, of the great *Musca* family, (2d N. Y. Rep., p. 297.) I say "*supposed* by Dr. Fitch," for, like myself, he was unable to raise his larvae to maturity. But as he says nothing of any gall-like bulge in the straws attacked by this larvae, which forms so remarkable a feature in the case of the larvae observed by me, my larvae and his larvae cannot be presumed to be identical.

I am rather inclined to believe that these orange-colored larvae change into a small beetle, belonging to the great *Curculio* family, to which also belong the pea-bug, the grain weevil, (which I recently illustrated in your paper,) the New York weevil, (which I have lately figured and illustrated in the St. Louis *Valley Farmer*,) and last, but not least, the notorious curculio. Almost all the insects of this family are vegetable feeders, and the great majority of them are internal feeders, *i. e.* live inside the substance upon which they feed. The larvae, too, of all of them, so far as known, are without feet, and several of them live in galls like the gall flies. The beetle to which I refer has been described by Say under the name of *Brachytarsus variegatus*, and Fig. IV is an accurate rep-

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resentation of it magnified, the annexed line showing its natural length.*

My reasons for this belief are two: 1st. Mr. Frick and myself found five specimens of this beetle between the leaf and the stem of the wheat straws in the same locality where the larvae occurred. 2d. Say states (Vol. II, p. 315) that "the species is not uncommon, and that he (Say) had found it *on the smut of wheat*, and Mr. Lea took *eighty individuals from six heads of wheat.*" Coupling these facts together, it seems pretty plain that the insect is connected with the wheat plant in some way or other, either as a devourer of it or as a parasite of some other insect which devours it.

Although, as before stated, the great bulk of the *Curculio* family are vegetable feeders, yet there are authentic accounts of two European species, belonging to the same genus as our insect, being parasitic upon bark lice, living inside their bodies like ichneumon larvae. (Westw. Intr. I, p. 332.) It is possible, therefore, and even not improbable, that the insect causing these swellings on the stems of wheat may still be to discover in its perfect state, and that *Brachytarsus variegatus* is parasitic upon him, and burrows inside his carcass.

It may not, perhaps, be known to many of your readers that a worm or larva, producing on the stems of wheat just such swellings as those I have described, and popularly called the "joint worm," has been known for the last ten years in Maryland and Virginia, "devastating the wheat to such an extent as to wholly destroy the crop in some fields." (Dr. Fitch, in *American Agriculturist*, August, 1861.) With this single exception, there is, I believe, no other instance on record of any insect either in the United States or in Europe, producing gall-like swellings on the stems of wheat. Dr. Fitch, Dr. Harris, and several other persons, have bred from parcels of such diseased straw, and obtained nothing but numerous specimens of a species of *chalcis fly*, closely allied, apparently, to that which I figured and described in the fourth volume of your "Transactions," under the name of *Glyphe viridescens*, as parasitic upon the army-worm. Dr. Fitch has named this chalcis fly *Eurytoma Tritici*, or the joint-worm fly; and he states that he and Dr. Harris together bred no less than 120 of them from one parcel of straw sent from Virginia, without obtaining any other insects whatever. Hence, and from there having been obtained nothing but *chalcis flies* of closely allied species from similar swellings on barley straw grown in Massachusetts, on barley straw grown in New York, and on rye straw grown in Pennsylvania, Dr. Fitch has come to the conclusion that these *chalcis flies* are, in all these cases, not parasitic, like almost all the

*I have never met with this insect near Rock Island. Two other species of the genus, however, *B. limbatus*, Say, and another, which Dr. Leconte pronounces to be as yet undescribed, occur there, the former abundantly.

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other hundreds of species of *chalcis flies* whose habits are known, but the real original authors of the disease, and consequently not the friends but the bitter enemies of the farmer.

It may be thought, perhaps, that my orange-colored larvae are simply the larvae of these *chalcis flies*, called by Dr. Fitch *the joint worm fly;* but they differ not only in being orange-colored instead of "white," but in living inside the hollow stem, instead of "in small cavities found under certain glossy elevated spots, like blisters, on the swollen surface of the straw." (Fitch.) Moreover, I only observed one larva in one gall-like swelling; whereas Dr. Fitch and others always found several—sometimes as many as six or seven. And further, the hole bored by my larva for its exit was full one-sixteenth of an inch in diameter, whereas the larva described by Dr. Fitch made "a perforation like a pin hole."

I cannot help suspecting, although it is with extreme diffidence that I venture to controvert such high authority as Dr. Fitch, that the real, veritable "joint-worm" of Virginia and Maryland is identical with the larva which I observed in Southern Illinois—whether or not that larva becomes in its perfect state the *Brachytarsus variegatus* of Say—and that the numerous chalcis flies bred by Dr. Harris, Dr. Fitch and others, are merely its parasites. The following are my chief reasons for this suspicion:

First. The gall or swelling in the stem of the wheat, observed by me in Southern Illinois, appears to agree exactly with that from which has been bred the "joint-worm fly" of Fitch, except in not having little blister like cells on its surface, containing the *chalcis* larva which develops into the "joint-worm fly." Now, if *chalcis* larvae had been feeding on the body of one or more larvae situate in the center of a gall-like swelling, it would be quite agreeable to analogy for them to make their way towards the surface, when nearly ready to develop into the pupa state, and for them to form there little cells or cavities to lie in, especially if they generally lie in the straw in the pupa state all through the winter, as we are told this species does.

Second. Dr. Fitch himself allows that "our best authorities in entomology inform us that the insects belonging to this (the chalcis) family are all parasites, living upon other insects, and not on vegetation." I only find a single exception to the rule, and that a doubtful one. Esenbeck says of a chalcis fly found in Europe, that

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tained no other insects whatever from these galls; and, reasoning on Dr. Fitch's principles, we should suppose the galls to be made by the chalcis flies. Yet the mere fact that two quite distinct chalcis flies being bred from these very peculiar galls, would sufficiently prove that the gall must have been formed by a third insect, probably belonging to the Cynips or gall fly family; and Baron Osten Sacken, from a similar gall, only somewhat larger, on the pin oak, has actually bred a true gall fly. (See his paper on Cinipidae, p. 62.) It is true that I only bred forty or fifty individuals, and Dr. Fitch, and others several hundreds, but the principle is the same in both cases.

Fourth. It is often the case that the parasite and the insect upon which it preys, come out into the perfect state at very different times. *Cynips Confluentus* of Harris, (which has been described by Baron Osten Sacken, under the name of *C. aciculatus*, from specimens sent him by me under the former name, but which I am informed by Mr. Norton, of Connecticut, who has compared specimens which I sent him with the original specimens of Dr. Harris, preserved at Boston, has been rightly identified by me,) comes out from the gall sometimes late in the autumn, but generally the following spring. On the other hand, one of its parasitic *chalcis flies*, of a genus allied to *Callimome*, always so far as my experience goes, comes out in the summer. Now the little beetle, (Fig. IV) which I suppose to be identical with the true "joint-worm," appears, as was before stated, the last of June or the beginning of July, in Southern Illinois, whereas Dr. Fitch says of all the four species of chalcis flies bred from swellings in the straws of wheat, rye and barley, that "these insects, or at least a considerable portion of them, remain in their cells in the straw through the winter, to come out the following summer." I conjecture, therefore, that the reason why Dr. Fitch and others have obtained nothing but *chalcis flies* from such diseased straw, is *because the real culprits had left the straw before it came into their possession*, just as my orange-colored larvae all "vamosed the ranch" in the ten or twelve days that intervened between my original discovery of them and my second search for them.

Fifth. The *chalcis fly* obtained by Dr. Harris from swellings in the straw of Massachusetts barley is a distinct species, according to Dr. Fitch, from the *chalcis fly* obtained by Dr. Fitch from similar swellings in the straw of New York barley. Now, I am not aware of any recorded instance where two insects, specifically distinct, produce UPON THE SAME PLANT galls or swellings which are undistinguishable in character. Dr. Fitch says himself that he "had confidently expected this barley straw from Central New York would give him the identical insect which had infested the Massachusetts barley." On the other hand, supposing these two distinct chalcis flies bred from diseased barley straw to be parasitic on some other insects which produced the swellings,

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there is nothing at all unusual in such a fact. It is an every day occurrence, as in the case of the oak galls before mentioned, and also of the army-worm, for the same insect to be parasitically infested by several distinct species.

On the whole, I am inclined to suspect that the larva which I found in Southern Illinois is identical both with the veritable "joint-worm" of Maryland and Virginia, which infests wheat, and with the insect which attacks rye in a similar manner in the State of Pennsylvania. It may or may not be, also, identical with the insect which produces the gall-like swelling in barley straw in Central New York and Massachusetts. I regret much not to be able to offer to the agricultural community something more conclusive and satisfactory on this subject. But let any northern entomologist go down into Egypt, and he will soon find how difficult it is, in the midst of the rich profusion of entomological wealth which comes pouring into his lap day after day and week after week in that glorious and magnificent country, to concentrate his attention as he would do at home, upon one particular object.

The subject discussed may probably strike many as frivolous. It is in reality of great practical importance. Mr. Cyrus Thomas has already discovered an *aphis*, or plant louse, most probably identical with the species which damaged that crop so seriously in New York in 1861, upon the wheat plant in Southern Illinois, in the month of January, 1862. And if, as I conjecture, the larva I found in Southern Illinois be identical with the "joint-worm" of Maryland and Virginia, which has for years done so much damage in those States, here we have another Eastern depredator upon the wheat plant, never previously seen among us, which is not unlikely to spread and become troublesome this current year. Proceeding on the hypothesis of the *chalcis flies* being the real authors of the mischief, and knowing that the great majority of these stay in the butts of the straw through the winter, Dr. Fitch has recommended burning the straw and the stubble to destroy them. But if, as I suppose, the real originaters of the disease come out into the perfect state the last of June or the early part of July, and the *chalcis flies*, which stay in the straw, are parasitic upon these others, and are, therefore, our friends instead of our enemies, burning the straw and the stubble would be making war upon our own benefactors. Setting aside its high scientific interest, and viewing it merely as a matter of dollars and cents, the question discussed is therefore of great practical importance. I may be wrong, but I cannot help believing that these poor, slandered little *chalcis flies* have good ground for suing Dr. Fitch for defamation of character, and that they will, beyond a doubt, if they only know enough to commence suit, recover most exemplary damages from him.

Rock Island, February 6, 1862.

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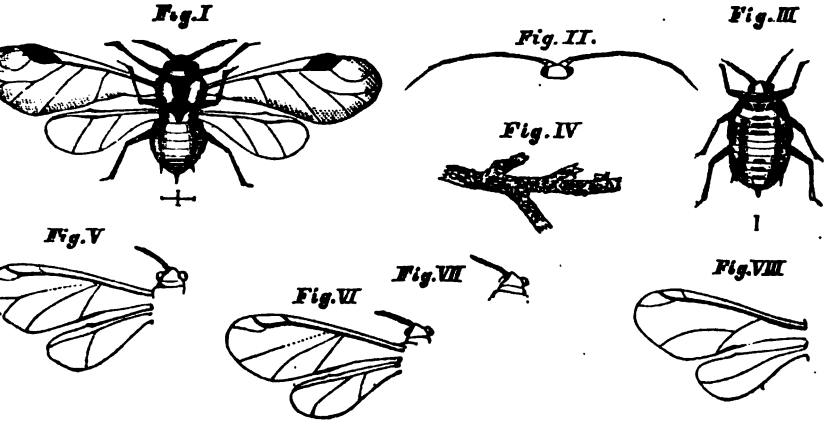

PLANT LICE—THE CORN-ROOT LOUSE.

A NEW ENEMY OF THE CORN.

About the latter end of May I was informed by Mr. George Mixter, of Rock Island, that his hired man had discovered minute insects in prodigious numbers on the roots of the corn in a field adjoining his private residence, and that they had apparently destroyed from one-half to three quarters of the crop so as to necessitate its being replanted. I paid a visit to the field about a fortnight later, and obtained many wingless specimens from which I succeeded in breeding fifteen winged females.

Fig. 3 represents, highly magnified, a female arrived at its full growth, and having rudimentary wings on each side, but probably not destined ever to acquire complete wings. The annexed line shows the natural length. The general color is a pale green, dusted over with a whitish bloom like that of a plum, and with dusky markings; of this type I only noticed three or four individuals.

The pupae from which I bred the fifteen full-winged females, were of the same size and shape as Fig. 3, and of the same pale green color, but entirely destitute of the dusky markings shown in the engraving; and the larvae only differed from the pupae in being smaller, and not having even rudimentary wings.

Fig. 1 represents a full-winged female, highly magnified, the cross lines annexed showing the real dimensions; the ground color, as in the pupae, is a pale green. Fig. 4 shows a piece of the root of a corn plant, as I saw it with my own eyes, swarming with these tiny pests.

The scientific reader will at once perceive that these insects be-

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long to the great *aphis* family, (plant lice) and that they appertain to the typical genus *aphis*, differing from that genus chiefly in having antennae of unusual shortness.

Dr. Fitch has described a species of *aphis* under the name of *aphis maidis* (the maize aphis), which attacks the stems of the roasting ears in August and no other part of the plant. As his description agrees tolerably well with that of the species which I found attacking the root in June, and as, in particular, he describes the antennae as being not quite half as long as the body, I suspect that they are the same insect, and that its normal habitat is the roots of the corn plant, but that later in the season when these dry up it betakes itself, to avoid starvation, to the stem of the ear. It is not at all improbable that a great deal of corn in various parts of the country has been year after year destroyed by this little creature, and that through its minuteness and its working underground, away from our eyesight, it has hitherto escaped observation.

Fig. 2 shows the head and antennae of the *grain aphis* (*aphis avenae*—Curtis) which swarmed in 1861, on small grain, in New York and New England, and which has this year been noticed both in Wisconsin and Illinois. The reader will see at once the great difference in the comparative length of the antennae; and there is the same difference between the antennae of the corn root louse and those of most other species of *aphis*.

All the species belonging to the genus *aphis* have two honey-tubes attached to the hinder part of the body, out of each of which issues, from time to time, a large drop of sweet sugary fluid. These honey-tubes are sufficiently plain in the *corn-root louse*, but in the *grain-plant louse* and many other species, they are nearly twice as long and very conspicuous. It is for the sake of the honey-like fluid thus elaborated that ants visit plant-lice; and wherever they are seen traveling backwards and forwards on a tree or plant, there a close inspection will always discover their milch-cows, the aphides. "The ant," says Linnæus, "ascends the tree that it may milk its cows, the aphides." "Ants absolutely," say Kirby & Spence, "possess the art of making the aphides yield this sweet fluid at their pleasure; or in other words, of milking them. On this occasion their antennae are their fingers; with these they pat the abdomen of the aphis on each side alternately, moving them very briskly; a little drop of the fluid immediately appears, which the ant takes into its mouth. When it has thus milked one it proceeds to another, and so on, till, being satiated, it returns to the nest."

It is worthy of remark that I noticed many small brown ants amongst the roots of the corn infested by the root-louse, and al-

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as "honey-dew," and sometimes greedily licked up by school-boys. The Roman Naturalist, Pliny, gravely hesitates whether to call this honey-dew "the sweat of the heavens, the saliva of the stars, or a liquid produced by the purgation of the air!"

Besides the genus *aphis* and one or two allied genera which have these honey-tubes more or less developed, there is a large group of the *aphis* family, comprising several distinct genera which have no honey-tubes at all. All of these, so far as known to me, secrete from the general surface of their bodies a kind of sugary substance, generally somewhat in the form of cotton-wool, in more or less profusion. Nature having debarred them from manufacturing molasses, they manufacture sugar. The "woolly plant louse" of the apple tree, which has occasionally destroyed whole orchards in England, but in this country is extremely rare, belongs to this group, and to a genus which has, from its woolly secretions, been named *eriosoma*, or, in English, *woolly body*. Another genus of the same group, *pemphigus*, which likewise secretes sugar, but in smaller quantities, is represented in this country by the *root-louse of the apple tree* (*pemphigus pyri*—Fitch) which is known to nurserymen to infest the roots of young apple trees, causing thereon unseemly knobs and excrescences. The wings and antennae of this species are shown in Fig. 4, and it will be seen at once that the upper wing differs from that of *aphis* in none of its veins being "sprangled" or branched, and that the antennae differ in being destitute of the long and slender seventh joint. Differences such as these, are not, as the casual observer might suppose, capricious or accidental, but in the same genus are generally uniform and invariable. Take a hundred winged plant lice from the foliage of an apple tree, and every one of them will have seven-jointed antennae, and the third vein of the front wing "sprangled." Take a hundred winged plant lice from the roots of the same apple tree and every one of them will have six-jointed antennae, and the third vein of the front wing not sprangled at all. When nature is the workwoman there are seldom any botches.

The ants are just as fond of sugar as they are of molasses. Two distinct species of this sugar secreting genus, *pemphigus*, one of which infests the roots of some forest tree and the other the roots of some herbaceous biennial or perennial plant, are, as I have myself noticed, kept in large numbers in the nests of a common yellow ant a little over one-eighth of an inch long, some nests containing many thousands of them. What is very wonderful, and what I can myself attest from my own repeated observations, the ants actually fetch these sugar producing cows in large herds home to their nests, which are often situated half a yard or more from the ground in half rotten stumps, honey-combed by wood-boring larvae, and totally destitute of any living roots of which the *pemphigi* could suck the sap. There they are suffered to remain for a certain period in little clusters of fifty or a hundred, which

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are generally located close to the chambers which contain the larvae of the ants; and what one would not *a priori* anticipate, the *pemphigi* seem perfectly contented there, and show no disposition to wander off. In an hour or two's time, such a dense mass of cottony sugar is secreted from these clusters of root-lice that their bodies become perfectly invisible. As soon as the sugar crop is sufficiently matured, the industrious ants no doubt feed it out to their hungry larvae, and carry the root-lice back to the roots on which they live to elaborate a fresh supply. I have repeatedly lifted flat stones under which these yellow ants often build their nests, and seen half a dozen or a dozen clusters of *pemphigi*, some naked, some enveloped in cottony sugar, attached to the under surface of the stone, and frequently almost immediately underneath some of the clusters, so as to have the babies close to their pap, groups of the larvae of the ants. I have then carefully replaced the stone, and upon visiting it again an hour or two afterwards, I have generally found that most of the *pemphigi* were carried away, no doubt by the ants. If, by way of experiment, you disturb the *pemphigi* and at the same time disturb the larvae of the ants, you will see the ants just as eager to carry off the root-lice to a place of safety, as to carry off their own larvae. Sometimes by digging down into the ground traversed by the tunnels of these yellow ants, I have come upon the pasture grounds where they kept their cattle, and have seen the tiny sugar-makers greedily sucking away at the roots, from which they derive their nutriment.

Man thinks it a great achievement, if, after half a year's labor spent in plowing and planting and harrowing and harvesting and crushing and boiling, he elaborates the weight of his own body in crystalized sugar. But here is a tiny animal which, taught by that All wise Power which alloweth not even a sparrow to perish uncared for and forgotten, has acquired whole droves of sugar producing cattle, and has only to fetch them home to harvest ten times the weight of its own little body in ready-made sugar. Verily under every stone, under every clod, yea, even under the most despised substances, there lies unknown and unread of man, a whole volume of Natural History written by the finger of the Great Author of Nature.

Besides the genus *pemphigus*, which is an under-ground sugar-maker as our *corn root-louse* is an under-ground molasses-maker, I am acquainted with three North American genera belonging to the great *aphis* family, which are sugar-makers like *pemphigus*. Unlike that genus, however, they live above ground, not in the open air, but inside of hollow gall-like swellings or excrescences produced upon various trees by the puncture of the beak of the mother plant-louse that founds the colony.

Several persons have pointed out to me this year galls like a cock's comb on the upper surface of the leaf of the white elm, fre-

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quently so numerous that every leaf on a tree will bear one or more of them. On opening one of these galls early in the season, there will generally be discovered the mother plant-louse surrounded by a host of her infant children in all stages of maturity, the whole enveloped in a gray, sugary dust secreted from their bodies. The size, even of the full grown insect, is very small being scarcely half as large as that of the corn root-louse. Its wings and antennae are accurately represented in Fig. 5, and it is scientifically to be designated as *Thelaxes ulmicola*, Fitch or the *elm leaf gall-louse.*

The second N. A. genus of gall-inhabiting sugar producers is *Byrsocrypta*, which has wings veined like those of *pemphigus* (Fig. 6,) but the joints of the antennae proportioned as in Fig. 7, the last joint but one a little longer than the last, instead of being much shorter. To this genus belongs an insect rather larger than the corn root-louse, which produces on the leaf-stalk of the cotton-wood and other poplars, just where it joins on the leaf, a hollow gall about the size of a hazel nut, inside of which the plant-lice are found as in the elm-leaf gall just mentioned. I have noticed trees where almost every leaf bore one of those galls. The scientific name of this insect is *Byrsocrypta populicaulis*, Fitch, or the *Poplar-stem gall-louse.*

The third and last N. A. genus of gall-inhabiting sugar producers, is *Phylloxera*, the veining of whose wings, the simplest of them all, is shown in Fig. 8. To this genus appertains *Phylloxera caryæ-foliæ*, Fitch, which inhabits a conical gall about a quarter of an inch in diameter on the upper surface of the hickory leaf and is about half the size of the corn plant-louse; also, an undescribed species, which may be called *Phylloxera caryæ-globuli*, inhabiting a spherical gall about three-eighths of an inch in diameter, on the leaf of the hickory. This latter species is full as large as the corn plant-louse. The habits of both species are the same as those of the *elm-leaf-gall-louse.*

The curious inquirer will perhaps ask how these gall-producing plant-lice manage to get out of the vegetable prison in which they exist, so as to deposit their eggs on the twigs of the tree on which they live, ready to start a new colony next year. Unlike the true gall-flies (*cynipidæ*)which belong tothe same order (*Hymenoptera*,) as the bees, wasps and ants, they are *suckers not biters*, and have no jaws, like them, to eat their way out with.

The scheme of the Creation is perfect and nature is never at fault. In all the galls, so far as I have observed, produced by species of the great *aphis* family, there is a natural slit somewhere which gapes open as the gall approaches maturity, and allows the prisoners to escape. It may be remarked at the same time, that as these gall-producers live like hermits, secluded from the great world, although they produce a considerable amount of gray sugar, those great sugar growers, the ants, cannot penetrate the green

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walls that inclose them, and are therefore compelled to leave them alone and undisturbed in their saccharine glory.

"But," the utilitarian reader will exclaim, "what is the practical use of being acquainted with the habits of these nasty plant-lice? *Cui bono?* What is the use of it?

Softly now, gentle reader, Listen two minutes longer and I will show you. When I was at Bloomington, attending the last annual meeting of the Natural History Society, I was consulted by one of their most eminent citizens on the subject of certain ants, which, as he affirmed, were ruining his *verbena* beds. I told him it was certainly not the ants that did the mischief, but some other insects, probably plant-lice, and that the ants only visited the *verbenas* for the sake of milking their cows. On adjourning to his garden, which like most of the Bloomington gardens was elegantly decorated with a profusion of flowering shrubs and plants, I found a large hole dug in the centre of a beautiful green lawn and surrounded by a heap of charred fire-brands and ashes. On all sides of this were smaller holes full of litter and rubbish. It was a piece of pandemonium in the middle of Eden. On inquiry, I found that he had tried digging out the ants, and had tried burning them out, and had tried scalding them out; and that the more he dug, and the more he burned, and the more he scalded, the more they seemed to increase and multiply. The *verbena* beds certainly presented a most miserable appearance, there was scarcely anything left of them but a few unsightly stumps. Although on a cursory examination I could find no plant-lice on them, yet on the next day a close inspection of other *verbena* beds in the same city, which were not quite so badly afflicted, revealed the plant-lice in abundance on the lower surface of the stems next the earth. I have no doubt, however, that the damage was partly occasioned by the attacks of a species of jumping insect, about one-fifth of an inch long, four times as long as wide, and of a dirty yellowish color with dusky markings, which I found swarming round all the *verbena* beds in Bloomington. It belongs to the great *tettigonia* family, and the same order (*homoptera*) as the plant-lice, which is all I am at present able to say about it.

Now if this citizen of Bloomington had been acquainted with the habits of ants and their milch-cows, the plant-lice, instead of *burning out* and *digging out* and *scalding out* the ants, he would have

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use. The *verbenas* would then have flourished in all their glory and the eye would not have been annoyed by ruin amongst the roses and destruction amongst the dahlias.

Reader, are you answered?

ROCK ISLAND, *August* 11, 1862.

GRASS-HOPPERS AND LOCUSTS.

When I was attending the State Fair, held at Freeport, in Northern Illinois, in the year 1859, I heard from the farmers of that neighborhood great complaints of the damage done them by grass-hoppers. Mr. Arnold, of DeKalb county, which also lies near the northern boundary of this State, says that his oat crop, in 1861, "was diminished at least ten bushels per acre by the grass-hoppers, who ate off the heads, the ground being literally covered with grain."—[*Jour. Ag. Soc., Feb.*, 1862.] But the fullest account of the ravages of these destructive insects is given in the *Country Gentleman*, of July 31, 1862, by Mr. O. H. Kelley, of Anoka county, in Minnesota, who writes as follows:

"For two years in succession—1856 and 1857—the grass-hoppers destroyed our crops, and many resolved then to keep two years' supply of produce on hand afterwards. One fact I noticed: although they ate the bark from saplings, and consumed our corn, tobacco, etc., ate holes in clothes hanging out to dry, destroyed boots and shoes when they lit on them in the house, yet peas they avoided, and it was an odd sight to see the field completely stripped, even of the weeds, and the pea patch left undisturbed. There was no turning to the right or left with them; they went hopping on to the tune of John Brown, and they may be hopping yet for aught I know."

What particular species it is that infests the crops in the Valley of the Mississippi, has not been clearly ascertained; but as the red-legged grass-hopper (*Caloptenus femur-rubrum*) is our commonest species at Rock Island, and as it is that species which is troublesome in New England, I suspect it is the principal offender with us. This insect is about one inch long. There are gigantic species in Central and Southern America, which are four inches long; and I recently received from Corinth, in Mississippi, a magnificent, robust, glossy black species of *Acridium*, with short pink wings, and closely allied to the mammoth species found further South, which measures two and three-quarter inches. But what are these

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when compared with certain (apocryphal) kinds, said by the Roman naturalist, Pliny, to be found in India, which were *three feet* (!!!) long, and had hind shanks so stout and thorny that the natives used them for saws! In California, and especially in Utah, grass-hoppers are well known to occur periodically in destructive swarms. A wingless species, which infests the Shasta Valley, in California, has been successfully fenced out of fields by a strip of tin 2½ inches wide, arranged so that, in order to get into the field, it must walk down one side of the strip, and turn a sharp corner to the other side—which as it appears it is unable to do. (Smithsonian Report, 1860, p. 423.)*

These insects are popularly known, both in England and in the United States, by the name of "grass-hoppers;" but they are undoubtedly closely allied to the "locusts" which ate up King Pharaoh, and to the all-devouring insect known as "locusts" in the Old World in modern times; and they are comprised in the family *Locusta* of the British entomologists. What are commonly called "locusts" on this side of the Atlantic, (properly "cicadas,") are as distinct from the "locusts" of the Old World as any two insects can possibly be—the first being *suckers* and the second *biters*—the first having their front wings glassy and transparent, the second having them leathery and opaque—the first having a mere apology for antennae, which the general observer would entirely overlook, and the second having rather long antennae. It is remarkable that, although these American bogus "locusts" are physically incapable of eating, seeing that they have no jaws to eat with, yet the earliest account we have of them asserts that "they did *eat up the green things*, and made such a constant yelling noise as made the woods ring of them and ready to deafen the hearers." (Morton's Memorial.) This is a good specimen of the slipslop way in which natural history was written by our grandfathers.

The true "locusts" of the Old World are eaten by the inhabitants of various countries in modern times, and we read that John the Baptist lived in the wilderness upon "locusts and wild honey." From the one of the comedies of Aristophanes (the Acharnians) we learn that "locusts," or, as we should call them, "grass-hoppers," were considered a delicacy in Ancient Greece, and were commonly exposed for sale in their markets. The Digger Indians, of California, eat them at the present day.

The wide difference between the true "locust" of the Old World and the bogus "locust" (*cicada*) of North America, has been pointed out by so many authors, that it would have been scarcely worth while to restate it, but for the fact that a certain Ohio naturalist, officially connected with the State Agricultural Society,

*From the rude figure given by Dr. Vollum, in the article referred to, it is manifest that this wingless species belongs to the Catydid family, (*Gryllidae*,) and not the true grass-hoppers, (*Locustadae*.) Wingless grylls occur also in South Europe and in Africa. (Genera *Saga*, *Tettigopsis*, *Bradyporus*, etc.

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has shown himself entirely ignorant of it. As the same distinguished author, however, denies the possibility of parasitic larvae, which live inside the bodies of other insects, having themselves other parasites living inside their own bodies—a fact attested years ago by Bouche, by Haliday, by Newman, and by Westwood, and which no entomologist of the present day doubts*—it may not, perhaps, be advisable to attribute undue weight to his authority.

ROCK ISLAND, *October* 20, 1862.

*To particularize, two species of *Hemiteles* and one of *Pezomachus*, are parasitic on *Microgaster intricatus*. (Haliday Ent. Mag., II., p. 468.) *Ophion moderator* is parasitic on *Pimpla strobilellae*. (West. Introd. II., p. 148.) *Eurytoma plumata* is parasitic on *Microgaster liparidis*. (Bouche Naturg. Ins. I., p. 166.) *Pteromalus braconidis* is parasitic on *Rogas linearis*. (West. Intr. II., p. 190.) *Chrysolampus suspensus* is parasitic on *Aphidius varius*. (West. Intr. II., p. 162.) *Pteromalus omnivorus* is parasitic on *Exorista larvarum*, a dipterous parasite, belonging to the same genus as that which has been described both by Dr. Kirtland and myself, as infesting the army worm. (Newman Mag. Nat. Hist., V., p. 252.) And lastly, *Coruna clavata* is parasitic on one of the *Aphidii*, which is itself parasitic upon an *Aphis*. (Haliday, Entom. Mag. II., p. 99.)

APPLE TREE BORERS.

It is well known to entomologists that there are two distinct "borers" infesting the apple tree. The one in the *larva* or grub state is a whitish, hammer-headed fellow, looking as if he had been squeezed flat between two squares of glass; and in consequence of his front end being about twice as wide as it is high, he bores a hole to suit the shape of his head—egg-shaped. The other in the *larva* state is a round or cylindrical whitish grub, and as his front end is round, he bores a *round* hole, not an *egg-shaped* one. He is also, when full grown, nearly twice as big as the other chap, and consequently his hole is a good deal larger than that of the other. In the *perfect* or *beetle* state, the FIRST is about half an inch long, with rather short horns (or antennae,) and, on a cursory view, seems quite a brown, dingy affair. A closer inspection, however, will show that his body above is marked with elegant brassy spots, and that underneath he is all glorious with brass and gold. In the *perfect* or *beetle* state, the SECOND insect is about an inch long, with very long antennae, and he is of a cinnamon color, with two broad milk-white stripes reaching all the way from his nose to his tail.

"But," some of your readers will say, "what is the use of knowing all this? What practical advantage is it to know which of two

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insects, equally mischievous and equally hateful, is destroying my orchard?" Not so fast, my good friends. We will come to the "practical utility" part immediately.

The first, or smaller insect, which is a *Buprestis*, attacks, as I know from my own experience, not only the trunk of the apple trees, either at top, middle or butt, but also small limbs not over three-quarters of an inch in diameter. The second, or larger insect, which is a *Saperda*, generally confines his attacks to the *butt* of the trunk, pretty close to the ground. Instances are known indeed of his attacking the trunk in the crotch, or where it branches out into limbs, but such instances are rare, and occur only where the parent beetle finds the butts of all the trees pre-occupied, and so takes to the crotch for want of its favorite locality. Small as insects are, they know a great deal. For instance, they all know enough to make good provision for their future families, which is more than some two-legged bugs that wear coats and pantaloons always know. Now I stated in my essay on "Insects Injurious to Vegetation in Illinois," (printed in your Transactions, vol., 4, p. 345,) that Dr. Fitch, the State Entomologist of New York, had proved by a decisive experiment that a certain preventive against the attacks of the *Saperda*, or big round borer, was "to rub the bark of the trees with soap, the latter part of May, each year;" but that whether soap was equally effectual against the little hammer-headed borer, (or *Buprestis*) remained to be proved. I have a small garden in Rock Island, about the size of a pocket handkerchief, in which I planted, some years ago, a dozen apple trees. In the spring of 1861, I dug out of these trees probably over a dozen borers of the hammer-headed kind, and having great faith in soap, about the last of May, 1861, I applied Dr. Fitch's preventive to all of them. To be plain and explicit, I took a bar of the newest and softest soap I could get (value ten cents,) and with this I thoroughly rubbed over all my trees, not only the trunks, but also such limbs as were three-quarters inch through. The result this spring (1862) is, that there is not a borer to be found in any of them; and I give the facts, just as they are, to your readers for what they are worth; of course it would have been far more satisfactory to have soaped half the trees and left the other half unsoaped, as Dr. Fitch did, and then if the soaped trees had been free from borers and the unsoaped trees full of them, the proof would have been pretty conclusive. But Dr. Fitch is paid by the State of New York for conducting such experiments as these, and therefore can afford to make them. We Western bug-hunters, on the other hand, who have to foot our own bills, cannot afford to sacrifice our own private and peculiar apple trees for the benefit of the public.

Now for the "practical utility" part. Look at your apple trees, and see if you can dig any borers out of them, and what shape and size those borers are; and if not, see if you can find the holes

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where the insects have formerly eaten their way out. If the holes are oval and rather small, say three-sixteenths of an inch, and not confined to the butt of the trunk, you may know it is the *Buprestis*; if the holes are larger, say the size of a smallish pea, and found exclusively in the butt, you may know it is the *Saperda*.

In the former case, if you have faith, as I have, in the "soap remedy," you must soap not only the trunks of the trees, but the small limbs. In the latter case it is sufficient to soap the trunk; and if you are driven for time, and soap is dear with you, probably it would answer to soap the crotch and the butt end of the trunk alone. *A word to the wise is enough.*

ROCK ISLAND, *April* 29, 1862.

The following paper of Mr. Walsh should have been inserted as a postscript to his article on "Insects Injurious to Vegetation," in this volume:

POSTSCRIPT.—Since the above was written, I have received from Phil. M. Springer, of Springfield, several specimens of the genuine army-worm moth, captured by him "in the spring of 1861, flying about the cherry trees in the evening, when the trees were in blossom." I have little doubt but that the millers seen by Conductor Montross, flying around the blossoms of fruit trees "in countless numbers," in the spring of the same year, at Centralia, were also army-worm moths. (*Prairie Farmer*, *June* 20, 1861, *page* 400, *column* 3.)

Suppose, now, there are 1,000,000 army-worms in a certain field, and that, by the action of the various parasitical and cannibal insects which attack them, 95 per cent. of the original number are destroyed before arriving at the moth state, there will then remain 50,000 moths to come out. Suppose further, that 99 per cent. of these develop into the winged or moth state the same summer, and that one per cent. lie over undeveloped until the following spring, we shall then have from one single field the respectable number of 500 moths appearing in the spring about fruit-blossoming time, 99,500 having come out the preceding summer. Add all those that make their appearance from other fields, and there will be good reason to speak, as Conductor Montross does, of "countless numbers," although when compared with the myriads upon myriads which are stated to have appeared in the summer at Pesotum, they form but an insignificant fraction.

I have assumed that only one per cent. lie in the pupae state through the winter. Whether that be the exact proportion, it is impossible to tell without experiments conducted on a large scale.

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As before stated, of fifty specimens, raised by myself and others, *every single individual* developed into the moth state the same summer, and I have demonstrated mathematically in the columns of the *Prairie Farmer* (December 5, 1861, p. 371,) that upon this assumption it is morally impossible for even as many as one in twenty, on the average, to lie over through the winter months; and that it is improbable that even one in fifty lies over. I should think, in the absence of experiment, and with the lights which we have from the analogy of other species, that one in seventy-five or one in one hundred will not be far from the truth, the proportion probably varying in different seasons. Whenever spring grain, sown upon spring plowed land, is attacked by army-worms which have bred in that spring grain and not migrated there from other crops, it must be the comparatively small spring crop of army-worm moths which laid the eggs from which these army-worms proceeded. There is at present no instance on record of an isolated field of oats or spring wheat, sown on spring plowed land, being badly infested by army-worms. In the cases recorded by Mr. J. C. Allen, of Stephenson county, (November 27, 1861, in *Prairie Farmer*) of oats being badly attacked by army-worms, the land was plowed in the fall, and, moreover, he himself allows that in each case there was either timothy or blue-grass adjoining the oats; and, although he adds that "there was no appearance of the worm in the meadows," yet I understand him by this to mean, not that the worms had never been there, but that, when he looked, there were none there. That army-worms sometimes breed in small numbers in spring grain, sown on spring plowed land, I have little doubt; but the spring crop of army-worm moths is not sufficiently large to give birth, as a general thing, to any ruinous number of them, and a small number would not attract the attention of farmers.

In reference to Mr. Thomas' first and original hypothesis, viz: that there are two distinct broods of army-worms, a spring brood and a fall brood, it may be stated that Dr. Bartlett, of Pesotum, wrote me word, on November 19, 1861, that his neighbor, "Mr. Phinney, who is perfectly familiar with the worm, states that on the 14th instant, a living army-worm fell from a corn-stalk while he was husking." In reply, I told Dr. Bartlett that I was confident Mr. Phinney must have been mistaken, and that the worm he saw was no army-worm, but probably the larva of some species

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with a single long thorn. The above facts may serve as a useful lesson to observers, not to be too hasty in identifying insects, especially in the larva state.

As regards the scientific question of the geographical distribution of the army-worm and its various parasites, it may be added that it has now been satisfactorily established by the researches of Dr. Fitch, that the genuine Illinois army-worm occasionally occurs in the Eastern States in the same profusion as with us, under the popular name of "black-worm;" and that it is attacked there by a large parasitic icheneumon fly allied to *ichneumon suturalis*, Say, and quite distinct from any species known to attack it in Illinois. It was shown in the text of my first premium essay, that *Tachina* flies had largely depredated upon the army-worm in Williamson, Union and McLean counties; we may now add Jackson, Champaign and Cook counties to the list. When the essay was printed, I had no evidence that the little parasitic ichneumon fly, which I have named *microgaster militaris*, was found outside of Schuyler county, but I have since ascertained that it occurred in the greatest profusion also in Champaign county; and from a letter recently sent to the St. Louis *Valley Farmer*, by Mr. E. S. Washington, of Callaway county, in the State of Missouri, there can be no doubt but that this, or some other small species of ichneumon fly, destroyed *more than three-fourths* of the army-worms in that vicinity in the summer of 1861.

The more we see and hear of the action of parasites upon our insect foes, the more grateful we ought to feel towards that All-wise Being, who says to the army-worm, out of the mouth of the small flies which He has appointed to do His work, "Thus far shalt thou go and no farther, and here shall thy proud armies be stayed."

B. D. W.

Rock Island, *May* 26, 1862.

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CULTURE OF COTTON IN ILLINOIS.

ON THE IMPORTANCE OF COTTON AS A CROP, AND ITS CULTURE ON THE PRAIRIES OF THE SOUTH HALF OF THE STATE.

By M. L. Dunlap, of Champaign, Illinois.

In consideration of the importance of the subject, I beg to lay before the Executive Board of the Illinois State Agricultural Society a few suggestions on the above subject.

The present high price of cotton, and the political changes being made in consequence of the present war, render it highly proper to make the inquiry if this is not an opportune time to consider the propriety of again placing cotton among the great staples of the State. In the south half of the State, as far north a Champaign, Macon, Sangamon, Morgan and Adams counties, it is well known by all the old farmers that cotton is a certain crop, in fact more certain of a full crop than corn or wheat, and that it was successfully cultivated in this northern tier of counties for over thirty years, and at points, more especially in the sheltered locations, in the timber clearings of Southern Egypt, has continued to be more or less grown up to the present time. Of the certainty of the crop there can be no doubt, and the only thing to be settled is the cost at which the clean cotton can be put in bales for market.

There can be no doubt that for some years, at least, to come, the price will continue high, from the fact that the cotton States, so-called, will not be in a condition, for a long time, to furnish their usual supply. It is also well known, that with good crops, for several years past, the demand for cotton has so far exceeded the supply that the price has steadily advanced. The new uses to which cotton has of late been put, in the way of sacks, sails and cordage, have made such demands upon it that it cannot possibly reach a low figure for a long time to come, even if the cotton States furnish their usual supply.

It is, therefore, proper that the Illinois State Agricultural Society should do all in its power to foster this interest, which is of such vital importance to at least half of the State, or rather to assist in re-

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storing it to its proper position among the staple products of that section. It is highly probable that in favorable locations it may be grown north of those counties, but this, we think, the exception rather than the rule.

In the first place, we propose to extend our inquiries to the northern points where this crop has been successfully grown.

In the early settlement of the Sangamon country, now better known under the name of Central Illinois, cotton was cultivated on nearly every farm, and was worked up into clothing and bedding by hand, and the domestic *linseys*, made of native cotton and wool, for a long time filled an important place in every country store, and even up to 1840, thousands of yards of it were sold in the city of Chicago, brought from the central portion of the State by the farmers, whose wives and daughters carded the cotton by hand, and spun it upon the *big wheel*—wove and dyed it by the kitchen fire.

WHAT DROVE OUT COTTON.

Steam on the lakes and rivers so cheapened transportation that other products paid a better profit, together with the low price of cotton and cotton goods at that time, so that its culture was no longer an object. The castor bean was the immediate successor of cotton, requiring about the same amount of labor to prepare it for market; next, corn and hemp, which have given place to the great variety of farm and orchard products. Thus it will be seen that the laws of trade have driven out three important staples within the last thirty years. When the culture of cotton was discontinued the price had become reduced to six cents a pound, and domestic sheeting to about the same price per yard. Now, the price of each is more than double that amount, while the staples that drove them from the field are cheapened in the market. It is, therefore, evident that this is a favorable time to resume its culture, while it is probable that the castor bean and hemp may at not no distant day be again on 'change. Under this state of things, to say nothing of the rebellion that at this time is cutting off our supply of cotton, it is of the first importance that we take into consideration the propriety of again placing it among the staple products of the great prairie slopes. During the present season we have lost no opportunity to become conversant with the history of cotton growing in our State, and of the propriety of recommending its planting on a large scale. We have come to the deliberate conclusion that in all parts of the State, south of 40 deg. of latitude, the cotton plant will flourish, and is as certain of a good crop as corn and wheat.

COTTON IN CHRISTIAN COUNTY.

A few weeks since we made a visit to Christian county, to examine a cotton field of ten acres, three miles from the village of Assumption, on the main line of the Illinois Central railroad. This

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field was planted early in May, but from the unskillfulness of the planting, the seed failed to germinate, and it was not until the 14th day of June that the seed could be obtained to replant it. Notwithstanding this late planting, the crop is a fair one, estimated at three hundred pounds to the acre. The growth of the plant was vigorous, and had it not been for the late planting, which has allowed only one picking, the crop would have come fully up to the best yield of Tennessee upland. So confident is the planter of its success and resulting profit, that he is making arrangements to plant two thousand acres next spring, while other parties in the neighborhood have engaged to plant one thousand acres in addition, making three thousand acres near this station. If seed can be had in time, the planting will extend through the neighboring counties, where several parties are making arrangements for seed to plant five to ten acres each.

Seed from the uplands of Tennessee will be used as the best adapted to this climate, producing what is called short staple upland. We have samples of the cotton grown on the plantation mentioned, which is of excellent quality.

Arrangements are also making at Assumption for the necessary buildings and machinery for ginning and baling three thousand bales the coming autumn. (A bale is four hundred pounds.) This settlement is largely composed of Canadian French, and some eighty farmers among them will at once enter upon its culture by putting in an average of twelve acres each. This will not interfere with their other farm crops, and at the same time will give them an opportunity to become familiar with the routine of its culture and preparation for market.

An old Tennessee cotton planter has resided within thirty miles of Assumption during the past twenty-seven years, and has grown more or less cotton each year since he came into the country. He says that during that time he has not failed in a single crop of cotton, though he has failed in both corn and wheat. He further says that on the prairie the plant grows larger, and will produce full as large a crop as the uplands of Tennessee, the superiority of the soil fully making up for the difference in climate. For the first few years he cultivated it largely, but the castor bean soon superseded it, and since that time he has only grown it for family use, and continues to dress in home-made linsey.

COMPARISON OF CULTURE WITH THE SOUTH.

The culture of cotton is almost as simple as that of corn, and, with our improved implements, will cost little more per acre than that crop. The additional labor will be thinning the plants in the row, which must be done with the hand-hoe, but on the prairie the necessity of repeated hoeings, to keep down the weeds, as given to the crops at the South, can be mainly dispensed with, on the same ground that we dispense with it in corn culture over that of the New England farmer.

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When sorghum was first introduced, it was supposed that it was only adapted to the sugar States, but it has proved to be best adapted to the States north of the Ohio, and, after seven years of doubt and experiment, has taken its place among the important staples of the State. Thirty years of experience have proved that the upland cotton of Tennessee and Arkansas is both hardy and productive with us, and the only question to consider is whether it will pay as well as other farm crops. When the price of good upland cotton went down to five or six cents a pound, and that of castor beans was a dollar a bushel, the beans took the lead and cotton was thrown out. But now, with our clipper plows, two-horse cultivators and iron rollers, there is no reason why we cannot compete with the bar-share plow, the nigger hoes, and the unskillful labor of the Southern cotton States. We believe that at fifteen cents a pound it will prove to be one of our best paying crops.

SUPPLY OF SEED.

Efforts are being made to procure an abundant supply of seed for the next planting, which will be advertised in due time. It will be sold at cost, whatever that may be, as the gentlemen engaged in procuring it are actuated more by patriotic than money-making motives. Those desiring small lots of seed can obtain them through the station agent at Assumption.

The government is also making arrangements to procure seed from Port Royal, but this, we think, will be of little or no value to our State. It certainly should not be depended upon north of Makanda, and even south of that point we would not plant it. The Port Royal seed is of the Sea Island variety, which requires some years of acclimation to ripen sufficiently early to be valuable with us. There can be no doubt, from the present position of our armies, that long before the time of planting arrives, we shall be able to obtain all the seed that we shall need for the coming season. Let the government instruct General Lane to send a thousand bushels of good seed from Arkansas, and General Buell another thousand from Tennessee, and it will be forthcoming. This, with what is now in the hands of farmers in the south part of the State, and what will come from Kentucky, will plant near twenty thousand acres, the product of which will amount to a million and a half of dollars, and do more to enrich Egypt than all her other products. We need not give the job of procuring seed to any other than our own troops, for give them the sacks and transportation and they will ship north all that can be planted. We want no Sea Island cotton seed, but that grown on the light uplands of Tennessee and Arkansas. Such seed, from long acclimation, will suit the heavy clay loams of the south half of the State, and will come to maturity in season for at least two pickings.

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HABIT OF THE PLANT.

No person not accustomed to the growing of cotton should at once enter largely upon its culture, for like all semi-tropical plants, in the early stages of its growth, the plant is exceedingly delicate, and requires that the soil be put in the best possible condition. It is useless to put in the crop in cloddy ground, or neglect it in the early stages of its growth.

In the early stages of its growth, cotton is an exceedingly delicate plant, and will not bear to be crowded by weeds, choked with unpulverized lumps of soil, or soaked with standing water. We need not be told that, with such habits of the plant, the soil must first be made friable; that if the land is cloddy, it must be reduced to fineness by thorough pulverization; nor that the furrows shall be deep, so as to absorb and drain off the falling rain. The farmer who attempts the culture of cotton near the limits of its growth, must be a thorough cultivator, for in the hands of a shiftless farmer, the crop will prove a complete failure. Corn may be neglected, and yet yield, in proportion to the labor bestowed upon it, ten, twenty, or fifty bushels; but not so of cotton; the crop must be either a fair one or a failure. The plant is semi-tropical in its nature, and from the time of planting to its final growth, must be pushed ahead with utmost vigor, and under no pretext will it do to neglect it.

INSECTS.

In the South the insect enemies of the plant are very numerous and destructive to it. Thus far, in this State, they have not been troublesome, nor may we expect to have the same difficulties in regard to them to contend against. While the light, sandy soils of the South are the hot beds for breeding all manner of insects, the deep clay loams of the south half of the State have no such tendency, and if they had, the rigors of the winter would be more damaging to the insect tribes, and with proper culture hold them in check.

TIME OF PLANTING.

The cotton plant will sustain a moderate degree of frost without being cut to the ground, but after having been once cut down by frost, unlike corn, it will not recover, and consequently must be replanted. The present season has demonstrated that planting as late as the 14th of June in Christian county, will give one picking of excellent cotton the last of September, but the bolls for the second picking will not be sufficiently developed to be opened by the October frost; hence, it is important that the plants get an early start, so as to obtain at least two pickings.

The cotton plant in its habits of growth is similar to the castor bean. The latter, in the South, is a tree of a foot in diameter, while at the North it becomes an annual; but with this great disparity

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of growth, with a rich soil and thorough culture, it is successfully cultivated at the North, and at one time bid fair to be the great leading agricultural staple of the State. In the tropics, the cotton plant is of two kinds—the tree cotton and the herbaceous; the former producing the largest crops, often six hundred pounds of clean cotton to the acre, while the latter seldom exceeds two hundred. In the temperate zone the herbaceous or annual cotton plant, improves in both quality and quantity, and som times rivals that of the tree cotton in yield. In looking over the statistics of the cotton producing countries, it will be seen that along the northern line of its culture the yield and quality are both the most satisfactory. Indian corn is another example of a wide range of climate, and which at the South can be planted at almost all seasons of the year, but while at the North the planting is confined to a few days, the quantity and quality of the yield is superior. We could name other products, but will be content with one more, the Imphee, of Africa. No where does the castor bean, Indian corn and the Imphee flourish more luxuriantly and produce better returns than in Central Illinois. Experience and analogy both prove that well tended cotton will not fail to produce a like result. The cultivators of the castor bean, of Indian corn, and of the Imphee, all know and appreciate the value and necessity of early planting, so as to push the growth of the plant forward before the dry season, which is so liable to occur during August and September.

Late planted corn will produce a small show of ears, and is valuable for fodder, and, taking the two objects together, is often a paying investment; but with cotton the case is different; the late planted will only produce a small return of bolls, while the stalks and leaves, unlike that of corn, are of no value. When we take into consideration that the late planting will require nearly the same amount of labor per acre, with the certainty of a scanty yield, it becomes at once self-evident that early planting is the only advisable plan to be pursued. In the south part of the State, where cotton has been grown from the time of its first settlement from the States of Kentucky and Tennessee, to the present time, no particular pains have been taken to produce large yields per acre by early planting, and hence we find that they generally plant in May, about the time of the heading out of the winter wheat. We were at Cobden the 18th of June last, and in the garden of Mr. Ben. Vancil the plants were in the first leaf, and at this time the wheat had been some time in shock. Mr. V. has spent a long life in that part of the State, and has always grown cotton for his family clothing, and as one picking furnishes an abundant supply for this purpose, he is content to do his planting after the hurry of the spring work. We are thus particular on this point, for it is one of the main points to success, and cannot with safety be overlooked.

Although cotton has been grown for a long time in the State, yet it has been of garden rather than of field culture, and we may

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be safe in saying that the crop mentioned is the first one on anything like an extended scale, and that most unerringly points to the absolute necessity of early planting. This garden culture fully accounts for the want of a more intimate general knowledge of the best time to plant, and of the amount of the yield. As one picking was sufficient for all the needs of the family, it was not necessary to double the yield, by extra care in preparing the ground, to run the risk of spring frosts that might add to the labor of replanting, and would require more labor in weeding out the plants, as it is well known that corn planted in April requires more labor per acre to keep down the weeds than if planted the first of June, though at the same time the early planted will return the greatest net proceeds for the outlay, when fodder is not taken into account.

In Champaign county, corn planting usually commences the 25th of April, and is continued as late as the 20th of June, though little of the late planted will ripen in ordinary seasons. From the 1st to the 20th of May is the favorite time of planting, and is seldom begun or continued later than that, by only those who have large fields to put in, or are delayed by heavy rains. We would, therefore, recommend the same time as the best for the planting of the cotton, and for all points south a corresponding earlier season. It is true that the farmers in the basin of Upper Egypt do not plant before we do; yet at the same time it is well known that their crops are similar to our late ones, and seldom come up to an average crop.

The plant will be from six to ten days in appearing above ground, and as we seldom have heavy frosts later than the 10th of May, we can, with good assurance of success, commence a week or ten days before this time, but even then we shall occasionally have to replant; but then the extra expense will be only a thorough harrowing of the surface to kill the springing up weeds, and the replanting, which, at best, cannot be very expensive.

QUALITY OF THE STAPLE.

It is highly gratifying to know that specimens of Illinois cotton have been examined on the other side of the water, and pronounced good. Most, if not all, of these samples were grown in Christian county, which may be considered near the northern limit of the Illinois cotton region, and here is what is said in regard to the subject:

LETTER OF A MANCHESTER COTTON MERCHANT.

"I sent your sample of Illinois cotton to Mr. Badsley, M. P. from Manchester, a most competent judge, and he writes me as follows:

"'Your sample of cotton is a most welcome indication of the power of the Federal States to produce cotton by free labor. Taking 8*d.* as a standard value of good New Orleans cotton, I estimate your sample as worth 25 per cent. more, or 10*d.* a pound;

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but from what I see of the fineness of the staple of the latter, and its strength when unmixed with defective and blighted portions, I think that with judicious cultivation it might acquire merits which would insure a value of 50 per cent. in excess of the New Orleans class. I rank it as superior to New Orleans cotton, but not equal to Sea Island.

"'A supply of 10,000 to 20,000 bags per week of it would be a great boon to this country. The letters you inclosed to me, I have sent, with the chief part of the samples, to the Cotton Supply Association.'"

There can be no mistake in regard to the quality, as we know, from comparing it with samples of Sea Island; but as it is the spinners who are to decide at last, it is pleasing to obtain so good a report at an early day.

PREPARATION OF THE SOIL.

So far as we can learn, the practice has been to plow the ground in the spring, but as this is the universal practice with all spring crops in that part of the State where cotton has been grown, we may take it for granted that the benefits of fall plowing have not been properly considered. Experience has proved that on our prairie soils the action of the winter frost on fall plowed land is highly favorable in weathering it down to a friable condition. In the case of the cotton plant, this is especially desirable, from the delicacy of its growth at its early stages. The soil must not only be finely comminuted, but it must be deeply mellowed, so that a heavy rain will at once sink below the roots of the young plant, otherwise it is liable to destruction by an excess of moisture. From the good effects of fall plowing for similar crops, we are so strongly impressed with its value that we would recommend and urge fall plowing for this crop. Let the plowing be deep, say eight inches, and if it be followed with a subsoil plow, breaking up the bottom four or six inches more, all the better. If anywise better, it will be better thrown into narrow lands. We would not re-plow in the spring, but give the surface a good stirring with a two-horse cultivator, at the time of planting. If the winter frost had failed to soften the entire surface, an iron roller should be passed over before the cultivator, to crush down the lumps. When manure is used it can be spread upon the surface of the fall plowed land at any time during the winter, when the surface is frozen, but at any other time we would not like to drive the team with a wagon over it. The manure will, of course, become incorporated with the subsequent working of the surface. If the plowing is delayed until spring, the same course should be pursued in regard to it, and the roller will prove to be an indispensable implement, always to be followed with the harrow or cultivator.

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THE SEEDING.

At the South a large amount of seed is used, not so much to insure a good stand—for the amount used is greatly in excess of this—but as a manure for the young plants. As seed is abundant and of little value for other purposes, and as manure is scarce, this liberal use of seed may well be excused; but at the present, when seed is scarce, a bushel properly planted will be ample for five or six acres. From the lightness of the seed and the adhering cotton, it is not positive that it can be planted with any of our seed planters now in use; and if not, hand planting must be resorted to. To do this the rows must be laid off with a common corn-marker, five feet wide, but they must not be deep, for the seeds of cotton on our soil must be planted shallow, not over one inch deep. Drop six or eight seeds in a hill, with the hills eighteen inches apart in the rows. Cover with a harrow, and finish with a roller.

CULTURE.

In from six to ten days the young plants will appear above the ground, and at the same time the seeds of weeds will not have been found idle, and as soon as the rows can be followed, the teams must be put to work. Use a two-horse cultivator, several kinds of which are now made, or treat it similar to broom corn. The two-horse cultivator that we use is well calculated for the work while the plant is small, but for subsequent workings probably no better than others. All weeds must be taken out from about the plants, and at the second hoeing all but one of the plants cut out, so that the plants will stand one in a hill, eighteen inches apart. The crop will need continual workings, with the double shovel plow and cultivator, one or both, and the first two workings will need looking after with a hoe, to thin out the plants and keep the weeds down about them, for it must be remembered that the plant is not strong like the corn, in the early part of the season, but when it does take a start in earnest, it is exceedingly vigorous.

Some cultivators recommend that the ends of the shoots be cut back, during July and August, so as to throw the vigor of the plant into the maturing bolls. but we have little faith of any good resulting, and many who have given it a fair trial contend that the extra labor is lost. A thorough preparation of the soil, early planting and thorough culture, are the main points, and such as will bear repeating on all occasions.

SHELTER.

There can be no question, that near the northern limit of its growth, shelter from the cold winds will prove of value in hastening the maturity, and will also prevent wastage by heavy winds blowing the matured cotton from the bolls. Should this prove of much importance in prairie culture, timber belts can be grown in

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a few years ample for this purpose, and while adding to the permanency and profit of cotton culture, they will beautify the landscape and render the climate more genial, by checking the heavy winds, which are often unpleasant.

SOIL, ETC.

The soil should be such as is well adapted to wheat, well drained, or free from standing water. It is not to be recommended to those not already acquainted with its culture, to go into it largely at once, for experience in all new things of the kind is needed, and there is, doubtless, yet much to learn in regard to its culture; but we have confidence that Northern energy and Northern ingenuity will overcome all obstacles in the way, and that at no distant day the cotton, the castor bean, and sorghum, will take their places beside the other great staples of the prairie.

It is fortunate that while the south half of the State is adapted to the culture of cotton, the rivers of the north half have a water power of almost unlimited extent. The Rock and Fox rivers pour their clear waters over beds of limestone of immense extent, affording water power of the most convenient class, at short intervals; while the vast body of the Mississippi at Moline, can be harnessed to turn millions of busy spindles, that may, at no distant day, send forth their products to clothe the inhabitants within the giant West.

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COTTON CULTURE IN ILLINOIS.

By C. Thurston Chase, Chicago.

In presenting some considerations on cotton growing in Illinois, it might be well to look over the whole field in which this plant is known to flourish, and to inquire into its history, the various conditions of soil, etc., by which it is affected; but the investigation would swell this essay to unreasonable length. I shall, therefore, confine myself to some interesting facts connected with its cultivation in our own country, and especially in that portion of the cotton growing region in the south which most nearly resembles that part of our own State in which it is proposed to undertake the business most largely.

The early white settlers of Southern Illinois came from the neighboring States of Kentucky and Tennessee, and some from Southern Virginia and the Carolinas. They brought with them the social habits and economic arts and practices of the communities from which they emigrated. Prominent among the latter was the cultivation of cotton. They raised the cotton and manufactured at home, for many years, what goods they wanted for domestic purposes and exported for a while considerable quantities of the raw material. The business was profitable at first; but after the invention of the cotton gin, and the consequent increased production in the more favoring fields of the South, it became less profitable here as a market crop, and was then only grown for home uses. But the introduction of improved machinery for manufacturing so cheapened the price of domestic goods that within the last thirty years, the busy sounds of wheel and loom have seldom been heard in the homes of our citizens. All but a few of the thriftier and more industrious, if not more old fashioned, still raise cotton, spin and weave it, and find it remunerative in a small way.

Having visited different portions of the South during times of only *party political divisions* between the two sections, and mingled freely among the people, spending days upon their plantations, observing, among other things, their methods of agriculture,

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I will offer some remarks, based on my own observations there, together with other information obtained from our own citizens who have continued to grow cotton successfully up to the present year.

CHARACTERISTICS OF THE COTTON PLANT.

The cotton plant has no resemblance nor family affinities with the cereals or sugar cane, the *Gramineae.*) These grow from a central germ of life, (if I may use the expression,) and readily spring up again when the first leaves have been nipped by the frost. Cotton (*Gossypium*) belongs to the natural order *walvaceae*, or the mallows family. When young it resembles buckwheat in appearance more than anything else we cultivate. Its young leaves are as sensitive to frost as buckwheat, and like buckwheat when once nipped it has no regenerative power. The cotton plant is every way exceedingly sensitive. If the weather be favorable it grows rapidly, but a cold wet spell checks its growth almost entirely. An excess of dry, hot weather is nearly as fatal. In either case its growth sometimes appears to be arrested for weeks, which, of course, puts back its period of maturity, and diminishes its product. On a deep, rich alluvial soil it has a rank, long continued growth. Then, a cotton plant becomes a small tree in form, six or seven feet high, with a large central stalk and many branches spreading out in every direction. The matured bolls will be large, the staple long and the yield enormous. But on dry, sterile, sandy land it makes only a dwarf and stinted growth. The central stalk is not larger than a riding whip, the head is contracted, the bolls small, and the staple short. Great profits are realized by the cotton planter on the low lands in good seasons, but he occasionally loses a crop by frost, excess of wet, etc. On the other hand, the upland cultivator never receives such large returns, and, in fact, it is only at the higher rates of cotton that he gets well paid for his labor.

There are many sub-varieties recognized. The two principal ones are based on length of staples, commonly known as the Sea Island or long stapled, and Upland, or short stapled varieties. The former is the finer and higher selling sort. The latter is adapted to Illinois.

THE SOIL, CLIMATE, ETC., OF NORTHERN PORTIONS OF THE COTTON-GROWING REGIONS OF THE SOUTH AS CONTRASTED WITH SOUTHERN ILLINOIS.

On the lowlands of the South a field hand will produce about $500 worth of cotton per year, under favorable circumstances. The cost of keeping him is about $30. The finest and longest staples are produced on the islands of the sea, and along the sea coast, hence the name. In these sections the time of growth is longer, and the conditions of the soil and climate most favorable. In point of richness, our American bottoms and the low lands along smaller streams compare well with the best lands of the

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South in their orignal strength, which have now produced crops for twenty successive years. Our uplands are as rich as theirs, and some much richer. We have a greater variety of soils, some of which are quite as favorable for fineness and strength of fibre as is much of their cotton land. While cotton growing is the chief employment of the planter in Southern and Central Tennessee, Northern Alabama and Mississippi, corn, wheat and rye are grown; also, cattle, horses, mules and hogs come in to make up the full year's business. They practice a mixed farming as our Egyptian farmers do.

Climate is really the great controlling influence in cotton growing. While the plant will flourish on nearly every variety of fertile soil within a certain belt, it will not perfect its growth in any soils beyond that. Sea Island cotton requires eight months for its maturity. Upland cotton has been perfected in half the time. But this is very much below the average period required. Some cotton is grown in Southeastern Virginia and Southern North Carolina. As you ascend the eastern slope of the Blue Ridge, the plant is not cultivated—proceeding southward, it occurs in Northern Georgia. After passing the mountain chain westward, it is found growing in the northern part of Alabama, and then northward in Central and Western Tennessee and Western Kentucky, even into Southern Illinois.

Now follow the summer isothermal line from South-eastern Virginia westward. It will be found, by reference to the charts on climatology prepared by Prof. Blodgett, of the Smithsonian Institute, that this line pursues the very course I have traced as the northern limit for growing cotton. South of this line the plant seems to be in its natural habitat. North of it patches of cotton may indeed be found flourishing, but they are only the fringes with which nature decorates the border of her whitening autumn fields. Cotton finds no genial climate near the western slope of the Cumberland mountains, nor on very near approach to the great lakes. The frost-freighted winds of the North forbid its cultivation on our northern prairies of deep, black mold more surely than could any legislative or military edict. But following the westward course of the same isothermal line, we may hope to find suitable locations for our "cotton patches" beyond the Mississippi and South of the Missouri river.

It is proper to remark that, while the average summer tempera-

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of Northern Georgia and Alabama, and through Tennessee and Kentucky, all engaged in a mixed farming, as our people of Southern Illinois are. They grow wheat and corn, and some oats, keep cattle and some sheep, raise horses and mules, and fatten some pork. The habits of the surrounding communities influence the business of individuals in them, in either case to some extent. There is also greater spirit of enterprise and thrift prevailing among those who pursue the mixed farming policy. The fields cultivated are smaller and the tillage is better than on the large plantations. The proprietors of the soil work with their own sons in the field, assisted by a few well cared for slaves. On the rich alluvial bottom lands, and on the large plantations the work is performed under a more rigid system of slave labor. The rule of those who work is not "how much and how well," but rather "how little by so much," and the whole country gives the response.

THE SOIL, ASPECT AND ELEVATION.

In the sections where cotton is grown, only a portion of the soil is well adapted to it. A heavy clay is bad, especially if the surface be level, because it holds the water. A clean, sandy soil is not strong enough. A northern aspect, and a high elevation are both too cold. The alluvial bottom lands of our rivers and branches, when dry enough, will probably be found best adapted to cotton growing in all respects, except their liability to frost. Leaving these, the first or second timbered table lands, or better, the sunny slopes looking out to the morning and mid-day sun, with a deep, loose, rich soil of sandy loam, may be regarded as the best lands, and the most favorably situated of any we have in Illinois; and we have much of that soil.

In selecting the "cotton patch," we should avoid a wet, cold, springy soil, and any situation exposed to frosts. No protection is necessary except that which checks currents of frost-freighted air from sweeping over the tender plants.

CULTIVATION.

The cultivation is often bad in the South. It begins with shallow plowing, is continued with bad weeding, which, owing to the great sensitiveness of the plant tells strongly against the yield.

The plowing should always be deep and twice repeated. *The use of the trench plow is necessary*, and even the sub-soil plow would be highly beneficial to give greater room for the water to settle away from about the roots of the plant. The soil must be well and deeply pulverized. Manure may be used advantageously to start the growth early and send it forward rapidly, but should not be so used as to continue it late in the season. To be more definite, fine manure, thoroughly rotted, covered with the seed is useful when the weather is damp, but heavy applications of coarse unfermented manures should be avoided. They would cause late fall

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growth, and therefore be decidedly injurious. The careful cultivator can gain time by soaking the seed before planting. Planting in drills was most common in the sections I have visited. They planted in April and May, and on ridges. This was necessary to raise the plants out of the wet, which would prove fatal to them. It was customary to throw up ridges from six to eight inches high, and two feet ten inches apart from centre to centre. In this State it has been customary to plant in hills, and a foot farther apart in rows. The seed was scattered along by decrepit old men and women thicker than we usually plant bush beans in garden drills. They carry the seed in sacks slung over their shoulders, a little after the manner a broadcast sower at the North carries his grain bag. The regular field hands follow and cover the seed about the depth which we cover corn. Side-hills were generally "horizontaled;" that is, laid out in ridges as above described, running around the hill. The ridges had a regular descent of a few inches to the hundred feet—enough to carry off the surface water to some ditch or gully. This "horizontalizing" is only required when the soil is loose and liable to wash by excessive summer rains. But when a planter has once got his field "horizontalized" he never allows the ridges to be plowed down nor effaced so long as he grows cotton upon it. In plowing for a second crop the plow that cuts down one ridge must also throw up another on the plowed ground. We should plant as early in May as we can and avoid danger of frosts, say from the first to the tenth of the month.

WEEDING.

Planting is scarcely over, on large plantations, before the first plantings have come up. As soon as the plants are out of the ground two or three inches, "scraping" the sides of the rows with the bull-tongue plow begins, throwing the dirt from the rows. The field hands follow with hoes. They carefully remove or cover all weeds, and cut out the surplus plants. A second, third, and even fourth and fifth time the cultivation is sometimes necessary, to keep the weeds down and the surface well stirred. The plants are thinned out at the first or second weeding. The cotton plant cannot endure the stifling effect of weeds. On the up-lands the plants are finally allowed to stand from eight inches to a foot apart in the rows. There will be some objection to planting on ridges with us. The crop will not be so easily tended with the plow and common cultivator. Some of the new cultivators—as Turner's, of Jacksonville—may be so set as to "scrape" the sides of the ridges with great facility. If we attempt to grow cotton in Illinois for

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Sowing winter wheat, about a bushel to the acre, among the growing crop, has been much approved of late. It is sown broadcast, worked in with plows or cultivators, the last of August. This is done to "rest" the land. A small crop of wheat may be harvested the next season, costing but little labor. The better way is to seed the land and pasture it.

There is more labor attendant upon producing cotton than corn, and the farther north the work is undertaken the greater will be the necessity for skill and diligent attention. Cotton growing in the South consumes the whole year. The processes of plowing, planting, weeding, hoeing, picking and ginning and bolling are scarcely completed when the plow must again be started, to prepare for the next season's crop. The general rules which should control corn growing apply to raising cotton: deep tillage, at first, on a dry soil, especially for cotton, with frequent stirring of the surface; and a *constant fighting of the weeds* during the growing season must not be disregarded.

PICKING.

Picking is a simple process, scarcely requiring comment. The labor commences in the latter part of August, and continues during favorable dry weather until snow flies. A sack slung over the shoulder, with the mouth opening conveniently for the hand to deposit the cotton as picked with the fingers from the boll. At night it is taken to the gin house or deposited in some other place for safe keeping. Among us, the "ginning" will probably be turned over to men who will follow it as a speciality—as the manufacture of sirup from sugar cane has been. A gin will cost, delivered at the farm of a Southern Illinois planter, from one hundred to three hundred dollars, according to the number of "saws" to a gin, the average price per saw to small gins may be set down at a little less than five dollars; of the large machines at about three dollars.

In conclusion, I beg to submit that it is not a question whether we can grow cotton in Illinois; that is a fact fixed by the cultivators of the soil. Nor is it a question whether, at the present enormous rates, we can grow it profitably; that is manifest. Nor is it a question whether we shall long have a blockade, that will keep the price up: that must soon melt away before the progress of events and the march of armies. But it *is* a question whether *hemp* would not be the more remunerative crop; and whether, after all, FLAX is not the plant to which we should look for the raw material for cloth and for a paying crop in nine-tenths of the Prairie State.

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PRACTICAL FARMING IN ILLINOIS.

By Charles W. Murtfeldt, Oregon, Illinois.

Very many pens and minds are now engaged in writing on agricultural subjects, and I certainly should not have undertaken to write the following were it not that the word *practical* here prefixed demands, or at least raises the expectation that a *farmer* should write on this topic. The nature of our soils and the natural location of our farming lands and prairies would also indicate, as well as the caption of this essay, that farming in Illinois differs somewhat from farming in the Eastern States.

As a rule, farming in Illinois must necessarily be what I design to call *mixed husbandry*. By this I understand the raising of the various kinds of grain and grasses, the rearing of horses, cattle, sheep, swine, poultry, etc., and orcharding, or the raising of fruit.

In all parts of the State of Illinois corn is, or ought to be, the great staple, and in the fifteen years that I have resided in this State and followed farming I do not recollect of a total failure of this crop, and before I shall undertake to give my views of a good preparation of this or any other crop, I would premise that where the land is not sufficiently rolling to admit of thorough surface draining, underdraining is indispensable to success, also a proper rotation of crops in most sections. The following rotation may be best: New lands, broken in June or July, should, in Middle or Southern Illinois, be cross plowed and sown to winter wheat, at the rate of one and a half bushels per acre, if possible, put in with a good seed drill; in Northern Illinois the same ground, prepared as above, should be sown to spring wheat at the earliest possible period in spring, no matter if frost and snow occur after sowing so the ground be in good order when the crop is put in. The best of wheat raised in 1858 and 1859, was put in early in March, and we had both snow and frost after that, every farmer entertaining fears of his seed rotting, but all came out right, and furnished the best of wheat.

The best time for sowing fall wheat is from August 28th to September 10th or 15th. The next crop should be corn. For this crop the land should be broken an inch or two deeper than ever

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before, and my experience is to break in April, harrow well, and, if designed to be planted in squares, lay off in rows three and a half feet one way and the other four feet, using a marker for the first and a single shovel plow or an eight inch clipper plow for the last, marking and plant immediately after the plow so as to have the seed—three or four kernels to the hill—fall in moist ground, where it will speedily germinate, and, getting a good start of the weeds, can be cultivated to advantage. I have seen a planter used and do good work where the ground was well prepared and marked one way, dropping, covering and rolling in the seed at one operation. My favorite method is the drill, cultivating one way, and using the hoe, if necessary; for I argue that the plants, a foot apart in the row, have a better chance to make and mature large ears than three or four plants standing in the same place or hill. I have incontestible evidence that even as far north as Ogle county one hundred and fifty-three bushels of corn have been raised on one acre, planted in rows three and a half feet apart, and the plants one to every every ten inches. Corn, as well as wheat, will be benefited by the use of the roller, as, indeed, it should always be used for small grain. If the breadth of land to be planted be so large that it cannot all be prepared in spring, I would plow as early as possible in the preceding autumn so as to have all foul seeds spring up and let "Jack Frost" have the chance to dispatch them. It will be necessary to use a good two-horse cultivator, or some utensil other than the harrow, (I do not deem the harrow sufficient,) to fit the ground, but should not, under any consideration, re-plow, because most of our prairie soils are already very light, and also, because the foul seeds would be brought to light and sunshine, germinate and afford a splendid opportunity for the use of plow and hoe, and, then, not afford a good crop of corn. In order to show the importance of this crop I will here record the saying of an old Pennsylvania farmer, in my neighborhood, who made Illinois his home over twenty years ago. Said he, "When I have a good crop of corn I have fat horses, fat cows, fat sheep, fat swine, fat poultry, plenty of eggs and good fleeces, and consequently a fat table, but let me have ever so much wheat, and little or no corn, and all this will not be so."

Wheat may be sown again, or rye substituted, and next, oats, when the land should be seeded down to timothy or clover, or, in Southern Illinois, to blue grass, and in low or wet lands to red top. Of rye one bushel and a peck will sow an acre; of oats from two and a half to three bushels per acre; corn, one bushel of seed will plant (the rows four feet both ways) from seven to eight acres; timothy and clover in proportion, of one-third clover to two-thirds timothy, and at the rate from eight to ten quarts per acre, I consider a good rate of seeding down; mow one year and pasture the next, if practicable, and after three or four years, having put on each year when mown a good top dressing of well rotted barn yard

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manure, the ground may be broken up and be better than new. If the farmer does his duty, under such a system, land will not deteriorate, but improve.

It is a well known fact that blue grass requires more than one year to set well, and is, therefore, better calculated for permanent pasture, likewise, it is not so easily subdued as timothy or clover. I have known a meadow, (up land,) from which a good crop of hay (timothy and clover) had been secured, broken up in October, sown to spring wheat (yield twenty bushels per acre) be again left to the grasses, without seeding, and have even a better stand than before. It is three years since then, and it affords a good crop of grass even now.

Necessarily something should be said here about the best mode of securing small grain. Many are the reapers and harvesters now in use, and the present very dry season furnishes also some data, which, by any observing farmer, ought not to be overlooked. Almost all reapers and harvesters have some merit, but I contend that machines, which are designed as headers, and also, this recent invention of reaping, threshing and bagging grain in one operation, lack, in some essential points—not in their operation—these may be perfect, but in maturing, and after—ripening of grain or sweating, more particularly wheat. Headers have been much used in the harvest of 1859, and this season.

Experienced grain buyers can tell by the touch if wheat has been secured by a header or reaper, and would not give near as much for grain secured by a header because it had not undergone the sweating process, and in large quantities would not keep, and even the flour would not keep, and would undergo the sweat. Necessarily the machine which proposes to reap, thresh, etc., all at one operation, is open to the same objections. The best mode of securing small grain, I contend, is this: after the grain has been cut and well bound, set up in round shocks of ten sheaves each, and cap well with two sheaves broke in the middle and laid, not across each other, but over each other, forming a perfect roof like an umbrella, which, if well and carefully done, will shed all rain. Grain may be cut to advantage when pretty green, so the berry is in the dough, as it is termed, and then it should not be suffered to lie on the ground, but should be set up as soon as possible and capped, as it will not dry out so quick, and cure more slowly. If the

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Very dry and flinty wheat, such as the "Black Sea," "Scotch Fife," etc., may be better prepared for milling by adding one-half bushel of water to every eight bushels of wheat, put into a box and stirred often for forty-eight hours before milling. It softens the bran, which, on account of being hard and flinty, cuts up with the flour, and, of course, makes it of an inferior quality. To prevent oats in spring wheat, make a strong salt brine and swim the oats out, and what little of the salt adheres to the seed will act as a good stimulant and fertilizer to the young plant, and prove an essential benefit. In stacking wheat it is essential to build of such shape as shall expose least to the weather, and, in building, to keep the middle full from the bottom up, and in topping out the stack not to draw in too fast, and the nearer the placing of your sheaves resembles good shingling the better will your grain keep.

CUTTING AND CURING GRASS.

At present, when machinery is made to do the mowing, and where machines leave the grass more perfectly spread than human hands can do it, when a man with a good horse rake can rake up eight or ten acres in half a day, I prefer to cut in the morning of the day, rake up in the afternoon, into even rows, and haul in the next morning if possible. By not cutting more than could conveniently be taken care of, keeping a sharp lookout for fair or foul weather, I have for the last two years secured all my hay without a drop of rain, or more than one night's dew, and without almost any cocking, taking it up out of the winrows, and I never saw better hay any where. For the information of such farmers as desire to cultivate buckwheat I would say the time of sowing is about the 20th of June, and the quantity per acre, one-half bushel; harvest as soon as the first light frost, and thresh as soon as well cured. I have reason to believe that buckwheat will remain in the ground from three to five years, and after all, germinate. Early fall plowing and allowing the frost to kill the plants will rid the ground of the seed in two or three years. White Beans to be raised as a field crop, should be planted about the 20th of May or as soon after as possible, in rows two feet apart so as to allow the shovel plow to be run through once or twice. It takes three pecks to plant an acre. When ripe, they should be pulled up and stacked around a stake firmly set, and threshed as soon as well cured out and dry. As intimated above, I consider mixed husbandry essential to success. If any branch may succeed alone it is the keeping of stock in certain localities. Certainly a farmer cannot succeed in raising grain alone without having his farm deteriorate, or expending largely for artificial manures, and yet there are thousands of such men in the State, who design only the raising of grain, taking from the farm every year, without restoring anything, too indolent even to haul out what little manure may accumulate from a span or two of horses and a cow, and here, I contend, may be

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found the reason why our average of wheat crops has been reduced from twenty to less than ten bushels, and corn from fifty to less than thirty bushels per acre, and some of these farmers seem to entertain the notion that their title deed does not run down more than two inches and a half, if one should judge from the depth they plow, and that in order that they may have a large harvest, they must run over hundreds of acres. A man, in order to raise a thousand bushels of corn, need not run over twenty-five acres, when the premium crops of every year almost plainly demonstrate the fact that one hundred bushels may be raised on an acre, and the labor usually spent in the cultivation of the twenty-five acres expended on ten would produce the crop, provided the ground was first put in the order it should be by manuring, etc., leaving fifteen acres to be used for other crops, and improving the land instead of reducing it.

The premium essays on raising of cattle, sheep and horses will, doubtless, bring out the true ideas. I will only ask permission here to say, that, in rearing of animals, *breed for a purpose.* If you design to raise valuable farm horses, breed from large, compact, well made mares and stallions that are nearly or quite sixteen hands high, weighing from twelve to fourteen hundred. If, on the other hand, you design to raise roadsters and light carriage horses, try the "Morgans," "Black Hawks," "Messengers," etc. Few, if any, farmers have the time, the requisite skill and the judgment to raise thorough breeds for the race course, for, I contend, he is a *skillful breeder*, who, by choosing his dam and horse, can produce just such a foal as he designed, any more than that, as a general rule, perhaps, "like produces like." Will any one deny that there is much hap-hazard work in the rearing of horses throughout our State? In the raising of neat stock, also, *breed for a purpose.* If for beef, raise "Durhams" and "Herefords," and their grades; if for milk or dairy purposes, the "Alderneys," and the choice of common stock or natives; if for the yoke, by all odds, "Devons." Sheep, also; if for wool, I should prefer the "Spanish Merino; if for mutton, the "Southdown," or "Leicester." Much profit and a good deal of pleasure will accrue from rearing of poultry. Every housekeeper knows the convenience of having plenty of eggs, and occasionally a fat pullet or a well basted turkey on "Thanksgiving Day." Besides, there are on every farm more or less wastings of grain, which would be lost if it were not that

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do not raise some swine, but it can also be made very profitable, particularly when beeves are fattened. The hogs follow up the stock and save all the wastings, and I know many successful farmers who prefer to feed their corn to hogs, knowing that this, one year, with another, will afford the surest profit. The "Essex" and "Suffolks are now preferred, as making the most and best pork on a given quantity of feed.

No man who designs to make the farm where he lives his *home*, but will embrace the first opportunity to set out fruit trees. In so doing care should be had to the locality, and such kinds chosen as are adapted to the location, and I think they should also be selected from nurseries close by; but mind, not every tree in the nursery that shews a fine growth will produce good fruit, or *that kind* which should be grown in your vicinity. By carefully reading a good agricultural journal, you may readily find out the best kinds of fruit to be grown in your particular locality, and in nine cases out of ten you may also get correct information in the nursery. In closing my remarks, I would briefly state my experience in fencing. The common English worm fence is too expensive in the greater portion of the State, requiring too much timber. A good post and board fence may be made for a dollar per rod, which, with care, will last ten years, but the best fence, in my humble opinion, to turn any stock, but hogs or sheep, is a wire fence, four or five wires, No. 7 or 8, best annealed; posts fourteen feet apart, with one spring post between. Of all fences I like the wire fence, when well constructed, suffering less from being raked by winds, and being easily kept in repair. The sum expended in fences in the State of Illinois is incredible, and the annual loss, accruing from poor and insufficient fences, amounts to tens of thousands of dollars. Cannot something be done to obviate this burdensome, expensive and troublesome difficulty? I am well satisfied there is a remedy. From my own personal experience and observation I say, without fear of successful contradiction, that the "Osage Orange" can, in five or six years, be grown into a hedge that will turn any stock in any part of the State of Illinois. It is in consequence of the many attempts and half way trials, swindling hedge companies, that this mode of fencing has gone into disrepute. I know as far north as Ogle county several miles of good hedge fence now turned out five years old. I am also inclined to the belief that it would be a great saving if we could have laws requiring every one to keep their stock fenced and leaving grain fields to the common. But the subject of fencing would be alone sufficient for an essay, and, having given my views, I forbear. There are, no doubt, other matters which might be embraced in practical farming, some of which I will briefly hint at. The sheltering and stabling of stock, of machinery, of having gates rather than bars, of mixing quick lime and charcoal with barn-yard manures, etc., and some others, which forming special subjects of essays, need not

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necessarily be here included. In conclusion, I would recommend that farmers' clubs be established to discuss the best modes of practical farming, and that State and County Agricultural Societies be fostered and encouraged; that agricultural literature be provided for every family, and that every farmer devote as much study and thought to his business, as every successful mechanic or artizan or professional man *must do* to his particular calling, and it will not be long before our beloved Prairie State will be agriculturally, as well as intellectually, the first State in the Union.

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ORCHARDS IN ILLINOIS.

By J. T. Little, Dixon, Illinois.

That the Illinois State Agricultural Society believe that orchards can be successfully cultivated in Illinois, is evident from the fact that they have offered a premium for the best essay upon the subject, and though the writer of this article does not pretend to be "one of the knowing ones," yet he believes that his experience and observation have taught him many of the causes of failure in orchards, (so-called,) and also what are the requisites for successful orchard planting and culture.

The vast amount of ignorance that exists upon this subject, and the tenacity with which men hold on to old theories and notions, upon which they have practiced at the East, or in the Old Country, is perfectly astonishing; and to this day, we hear men, who, upon other subjects, appear to be perfectly sane, declaring with all apparent sincerity, that it is of no use to plant orchards in Illinois; that, in the first place, if the trees are planted they will all die; in the second place, if they live they will never bear; and lastly, if they bear, the fruit will be good for nothing. Thanks to our agricultural journals, and to the efforts of the Illinois State Agricultural Society, the number of these *intelligent* individuals is growing small by degrees and beautifully less, and a spirit of inquiry is abroad in our land, as to what is the best location for an orchard, what the best soil, what the best mode of culture, and what are the best varieties. I propose to answer these questions in a plain way, and hope to do so in such a manner as to put the sincere inquirer upon a path that will not lead him astray.

And first, the location. The highest, dryest ground upon the farm should be chosen for the orchard. It is useless to expect that trees will thrive upon a low, or even a level, clammy soil. Drainage! drainage! drainage! trees must have. High, rolling, ground, then, with good natural drainage, if possible, should be chosen. A northern, or northerly exposure is better than a southern one, as trees upon such a location are less liable to be affected by the

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sudden changes of temperature in the winter and spring, than upon a southern exposure. The frequent thawing and freezing in our climate causes a great many of the diseases in fruit trees.

A timber soil, "oak openings," "clay barrens," appears to be better adapted to the production of fruit than our prairie soil. Trees fruit younger, and seem to devote their energies to the production of fruit, rather than wood. Yet, on such a soil, trees grow *fast enough.* (We stimulate our trees too much, as a general thing. But *good* fruit, and plenty of it, can be raised on prairie soil, if high and dry, and bringing the clay up from below and incorporating it with the prairie soil, is a great improvement.

It will not do to dig *wells* for planting trees, in any soil. The ground for an orchard should be well and deeply plowed—trench plowed—using two plows, one following the other in the same furrow, unless the Michigan double plow is used; it should then be thrown up into ridges, where the rows are to run, leaving a deep, dead furrow in the centre of the space between the rows. Digging the holes is a small matter, when the ground is thus prepared. Indeed, we have known holes to be made by running a common road-scraper across the ridges.

Trees planted upon ridges prepared as above, find plenty of food for the young rootlets to seize upon, and are in no danger of getting the consumption from wet feet. Before planting, the ends of the roots should be cut off smoothly, with a sharp knife, cutting on the *under* side, and *from* the trunk, and all bruises or scars should be smoothly pared off.

The holes should be dug so deep that the roots of the tree, when set, shall be covered about one inch deeper than they were in the nursery. When the ground settles it will leave them at the same depth as before removal. In planting, the tree should be held so as to lean toward the southwest, (the prevaling winds being from that quarter,) and by leaning the tree in that direction the sun's rays will be less likely to scald the trunk and prepare the way for the borer. The roots should be spread out in their natural position, and the earth well filled in about them by hand, that there may be no cavities left for air, dry mold and canker. The earth should be moderately pressed about the roots, and the tree firmly fixed in the soil. In spring planting, the surface should be left like a shallow basin around the tree. In the fall, a mound, twelve or fifteen inches high, should be raised around the tree, which answers as a brace, and prevents the water from standing about the roots and the frost from heaving the tree out in the spring. After the ground has settled in the spring, the mound should be levelled down and the surface left as in spring planting. The trees should then be mulched)whether planted in fall or spring) with long manure, half rotten straw or chip manure. There is nothing like mulching for newly transplanted trees, and it should be applied to the depth of four inches, covering the ground to the full circumference of the hole

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dug. When winter sets in, the mulching should be removed from about the trunk of the tree, to prevent mice from girdling it.

Fall planting, if well done, and the tree protected by a mound of earth, is preferable to spring. The tree starts earlier in the spring, and makes a better growth the first year. Farmers have more time than in the spring, and the stocks of trees in the nurseries are fuller in the fall, affording a better choice than at the time in the spring when farmers generally make their purchases, for they usually put off tree planting until after putting in their spring crops; and sometimes, in wet seasons, they cannot plant at all, but are obliged to wait another year, while a wet spring gives newly planted trees an impetus which is felt for years.

Corn is the best crop to raise in a young orchard, the first two years after planting. The cultivation necessary for the corn is just what is needed by the trees, and they are shaded by the corn during the hot weather of July and August. Potatoes, or some crop which requires good cultivation during the summer months, should follow the corn, or, if desired, the ground can be wholly given up to the orchard, plowing the ground lightly in the spring and stirring it two or three times during the summer with the shovel plow or cultivator. I should have mentioned that the top of the tree, at the time of planting, should be shortened back in proportion as the roots had been shortened in taking the tree up, preserving the equilibrium between the roots and the top. A good rule is, to cut off what would be equal to two-thirds of the last year's growth. To many people this appears but little short of barbarous, but "a good surgeon never spares the knife."

About all the pruning trees require is to keep the limbs from interfering with each other. The *worst* time to prune is in the spring, when the sap is starting. Fall, on the whole, or rather from midsummer to the middle of autumn, is about the best time. If an application of "shellac paint" (gum from shellac, dissolved in alcohol, making it about as thick as common paint) is made to the wound, pruning can be done at any time, and this, or grafting-wax, should always be applied to the wound when a limb over an inch through is cut off.

Trees should be kept cultivated until they come into full bearing. Never sow grass or small grain among them before that time. If seeded down, after the trees are in bearing, the grass where mown should not be taken off the ground, but strewn over the ground, around the trees, as mulching or manure.

In selecting trees for an orchard, choose young, thrifty trees, that have been grown where they have plenty of room, with low, symmetrical heads, branching out from two to two and a half feet above ground. If you have but a short distance to move trees, and can get them taken up with nearly all their roots, if you will take good care of them while out of the ground, not suffering the roots to dry in the least, dig broad holes and set them with the

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greatest possible care, shortening in the tops severely, it will, perhaps, pay to plant a few large trees; but for a healthy, permanent orchard, trees three and four years old, are decidedly the best. The trunk of a low-headed tree is shaded from the hot suns of summer, is less exposed to the sudden changes of winter, is less affected by our high winds, the fruit is less likely to be blown off, is more easily gathered, and the ground as well as the trunk is shaded by the top, protecting it from drought and preventing the growth of weeds.

Twenty-five feet apart is a good distance to plant. Close planting is recommended by all experienced orchardists. By it the trees protect each other, and the cost of cultivation of the same number of trees is lessened; but upon the prairie, a belt of timber around the orchard should be commenced simultaneously with the orchard. The silver maple is a rapid-growing, round-headed tree, perfectly hardy, and does not sucker. By planting two-year old trees of it, a good wind-breaker can be obtained at a small price, which will add much to the beauty and value of the farm. The gray willow grows very rapidly, and is perfectly hardy. Where this cannot be had, the cottonwood may be planted, and will make a good protection. It is not as clean and desirable a tree as the silver maple, and is objectionable on account of its suckering. But the most effectual, as well as beautiful protection, is a belt or belts of evergreen, composed of the Norway spruce or *arbor vitæ*, with Scotch or Austrian pines intermixed among them. The time is soon coming when evergreens will be afforded at a price that will enable every farmer to protect his orchard and beautify his home with them, and, in cultivating these, he will also be cultivating in his family a taste for the beautiful. We come now to varieties. Fifteen to twenty varieties are as many as the farmer needs; more than that number will only be a source of trouble and care. Nurserymen are yearly cutting down their lists, and discarding all except those adapted to this climate, *hardiness* being an absolute essential. We would recommend the following named varieties, in the order in which they stand—those considered most valuable, for say twelve or fifteen varieties, coming *first* on the list, considering hardiness, productiveness and quality.

For Northern Illinois.—*Summer*—Carolina Red June, Sweet June, Keswick Codlin, Benoni, and (on clay soil) Early Harvest. *Fall*—Saint Lawrence, Snow, Maiden's Blush, Lowell, Fall Swaar, Bailey's Sweet, or Ramsdell's Sweet. *Winter*—Dominie, Wagner, Jonathan, Roman Stem, Fulton, Winesap, Willow Twig, Talman Sweet, White Pippin.

For Central Illinois.—*Summer*—Early Harvest, Keswick Codlin, Carolina Red June, Sweet June, Hocking, Benoni, Summer Pearmain. *Autumn*—Maiden's Blush, Rambo, Trenton Early, Snow, Bailey's Sweet, Fall Swaar. *Winter*—Dominie, Jonathan,

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Roman Stem, White Pippin, White Bellflower, Milam, English Golden Russet, Smith's Cider, Raule's Janet, Willow Twig, White Winter Pearmain.

For Southern Illinois.—*Summer*—Early Harvest, Carolina Red June, Red Astrachan, Keswick Codlin, American Summer Pearmain. *Fall*—Maiden's Blush, Rambo, Buckingham, Snow. *Winter*—Winesap, Milam, White Winter Pearmain, Peck's Pleasant, Pryor's Red, Carolina, Willow Twig, Limber Twig, Raule's Janet, Little Romanite.

The apple being the orchard fruit for Illinois, I have not deemed it necessary to touch upon the cultivation of other fruits.

The same general treatment (with such variations as will suggest themselves to the mind of the intelligent cultivator,) will answer for the pear, plum and cherry. For the special treatment of those fruits, I would refer the reader to the "Transactions of the Illinois State Horticultural Society." Every man who has an orchard, or who intends to plant one, should become a member of the State Horticultural Society, and renew his membership yearly, by doing which he will be entitled to a copy of the published "Transactions" of the Society; and if he is not able to attend the yearly meetings of the Society, he will get a full report of all the discussions participated in by the most intelligent and experienced horticulturists in the West.

Gathering and Storing Fruit.—All fruit should be carefully gathered by hand. Shaking and pounding the trees is not only an injury to the fruit, but also to the tree.

Summer and fall fruits must be very carefully handled, and marketed as soon as possible after they are gathered. The barrels or packages should be perfectly clean and packed as full as possible, tightly headed, that the fruit may be kept in its place while in transitu.

Winter fruit may be left in a cool, dry room, in shallow heaps, for a week or two, to throw off the sweat or surplus moisture, after which it should be assorted and packed in clean, dry barrels, (if for shipping,) the barrels well filled, and the heads tightly pressed in upon the fruit and headed up. If for home consumption, or long keeping for spring or summer market, it may be packed in barrels as for shipping, and left as long as frost will admit in an out-building, but when there is danger of freezing, it should be stored in a cool, dry cellar. Or, instead of packing in barrels, it may be taken immediately to a dry, airy cellar, laid upon shelves or traps in layers two to four deep, the shelves being in tiers, one above the other. This latter arrangement affords a good opportunity for examining the fruit during the winter, and of removing decaying specimens. When placed on shelves, as above, the cellar windows should be raised in mild, dry weather, for the admission of fresh air.

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ORCHARDS IN ILLINOIS.

By W. C. Flagg, Moro, Madison county, Illinois.

Given a State nearly 400 miles in length—378, say the geographers—bearing on one extremity the pine and cranberry of the North, and on the other the cypress and cane of the South—stretching from the latitude of Washington to that of Boston—alternately swept by the cold winds of the Arctic circle, or fanned by the warm airs of the Gulf—its climate modified by immense plains, dense forests and girting rivers—its soil as varied, from the sands of Lake Michigan to the limestone of the Mississippi bluffs, and from the black soil of Central Illinois to the white land of Egypt—given all these varieties of climate, soil and surface, and we have a sufficiently arduous task to advise wisely in the matter of orchards.

No man, unless he have more personal knowledge of the various sections of the Prairie State than the writer hereof believes he or any other possesses, can be deemed competent to the task. All he can hope to do is to add to his own experience the observation he has been able to make of the experience of others, and to deduce therefrom rules sufficiently general for our whole vast extent of latitude, and occasionally particular enough to apply to localities.

It is a common fault of our agricultural, as well as other writers, to generalize too much from their own experience. If A has poor success in wheat growing upon a given soil, he believes and declares that B, C, D, and the rest of the alphabet, will do no better on different soils, and perhaps in a different latitude. Perhaps in no way have the valuable facts adduced by practical men been rendered so valueless and even injurious as by the unscientific manner in which they have been handled by their originators. One of two results has followed: either the writer destroys his own influence by his vague and wild assumptions, or leads the credulous into erroneous and ruinous practical conclusions.

I cannot expect to entirely avoid this almost universal error, but I will do what I think every writer on rural affairs should. I will give my own point of view, that the reader may make his own abatements for differences between him and myself.

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My orchard is situated a few miles south of the 39th parallel of latitude, and very near the 90th of longitude, west of Greenwich, which places it on the northern line of "Egypt." It is a few miles west of the divide between the waters of the Mississippi and Kaskaskia; is six miles from the bluffs that skirt the great "American Bottom," and nine from the Mississippi. It is on the white soil of Egypt, on the eastern side of a narrow prairie, lies high and dry on the ridge between two creeks, and is sheltered on the north and east by young woods, and on the west by a few locust and walnut trees. It was set out in various years, 1822, 1837, 1843, 1858, etc. The most extreme cold recorded here was that of January, 1856, when the thermometer sank 22 deg. below zero, whilst the extreme heat has never exceeded 100 deg. above. The winter of 1830–'31 was, however, probably as severe as the one mentioned, and Dr. Engleman, of St. Louis, (twenty miles distant,) records as the severest cold ever known in his observations, 25 deg., which was on the 8th February, 1835. These facts I will ask the reader to bear in mind, as they will all have an influence upon the facts I adduce and the views I advance.

I shall consider in this essay the Apple, the Pear and Peach, as the three most valuable and important fruits of our State, and as kinds generally known and planted in orchard quantities.

I. Apple Orchards.—1. *The Selection of Trees.*—In selecting trees I regard as a prime requisite stocks grown from the seed of a hardy and vigorous variety. The Milam is said to be such an one by our old settlers. One gentleman I know of prefers the Gilpin as making the best roots. My own experience would lead me to choose the Pryor's Red, as in my orchard it "still stands strong" and faithful, forty years after planting.

> "Quod non imber edax, non Aquilo impotens
> Possit diruere."

As regards the best mode of propagation, I do not find in my own or others' experience a satisfactory answer. The subject has not, I think, received the attention it deserves, and should have more discussion in our horticultural meetings. The objects to be attained are a perfect, and consequently healthy and long-lived

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As regards the kinds and quantity of each, that must vary with the location and purpose of the orchard. If it be for family use, the main object will be to have a succession of good eating and cooking apples through the season, with less attention to abundant bearing, fine appearance and evenness in ripening than in the case of market fruit. The usual number is one hundred trees, which is a larger number than is necessary for most families, but is an error on the safe side. For market purposes, one thousand trees is the conventional number; and here we want abundant bearers, showy fruit, ripening simultaneously, and not too tender to bear transportation. If but one market is had in view, the peculiar wants and tastes there represented should be noted and attended to. Early fruits should not be planted in too large a proportion. They cannot wait on a glutted market.

With these preliminary remarks we may proceed to enumerate varieties.

Here is a list of fruits which will pass muster from one end of the State to the other, and did so at the late meeting of the Illinois State Horticultural Society. They were equally favored by the Merimec and State Horticultural Societies of Missouri:

1. Early Harvest.
2. Carolina Red June.
3. Maiden's Blush.
4. Winesap.
5. Raule's Janet.

This list, though imperfect in the matter of succession, would perhaps be the safest for an inexperienced orchardist desirous of starting a market orchard, and with the addition of another fall apple, would answer tolerably well for family use. At any rate, it would form the nucleus, and the varieties therein enumerated a principal part of the orchards in Illinois.

The following list is more perfect in the matter of succession, but would not be received with the same unanimity, although not far from it:

		For Market.	Family Use.
1.	Early Harvest	50	5
2.	Red Astrachan	50	5
3.	Carolina Red June	50	5
4.	American Summer Pearmain	50	5
5.	Maiden's Blush	50	5
6.	Rambo	50	5
7.	Yellow Bellflower	50	5
8.	Winesap	150	15
9.	Raule's Janet	250	25
10.	White Winter Pearmain	100	10
11.	Willow Twig	100	10
12.	Gilpin	50	5
		1000	100

I would consider this a safe list, not only for family use, but, if the owner wishes to be in the market all the season, for market purposes also, for every part of Illinois.

To this, of course, would be added the favorite apples of that

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particular part of the State in which the orchard might be planted; but these I will not undertake to specify.

As to the quantity of each kind, I would raise about in the proportion given above, which would give two-tenths to summer, one-tenth to autumn, and seven-tenths to winter fruit.

2. *Location.*—As a tree exists in two elements—earth and air—we must have regard, in the location of an orchard, to soil and climate. As regards the latter, it is modified in any given latitude by water, woods, or other protection, elevation or aspect. The aspect everywhere, I suspect, and certainly here in Egypt, should be to the north-west; but I do not consider it a matter of prime importance. The elevation is much more important. An orchard should, in this State, be on the highest possible local elevation, where the cold and frost-laden air cannot ascend, but will drift down the hollows and slopes to the low grounds. Protection by natural woods, planted belts, hedges and close fences, is comparatively unimportant in Egypt, but apparently of vital necessity on the wide prairies of Central and Northern Illinois. I think this need has increased with the settlement and cultivation of the State, which has evidently made the country and atmosphere drier. There is less water to give out latent heat in freezing, to keep down warmth in a thaw, and wrap in vapor the tender buds of autumn and spring time. For this reason, I suspect, the peach crop is more frequently destroyed than formerly. However this may be, ours is what Humboldt, in his Cosmos, (vol. I, p. 328,) calls a "continental climate," and we are of those who, as he says, "seem almost condemned, as Dante expresses himself,

'A sufferir tormenti caldi e geldi;'"

or, as Milton perhaps imitated, to

"——— feel by turns the bitter change
Of fierce extremes, extremes by change more fierce."

To mitigate these torments, for ourselves and our orchards, protection is always desirable. The effect of water to the windward side is of great utility, and should always be sought. St. Joseph, on the eastern shore of Lake Michigan, and above the latitude of forty-two deg., is practically more than two degrees south of that line, owing to the tempering influence of the lake, and sends 30,000 bushels of peaches to the Chicago market, when the broad and fertile plains of Central Illinois can hardly supply its own wants. The same is true in a less degree of the apple crop. The bluffs of the Mississippi and Illinois rivers would appear on this account to be particularly adapted to fruit, and such, in fact, are the accounts we receive from those points.

The choice of soil for apple trees in Illinois is a matter of minor importance. Our *dry* soils all grow the apple tree well; the white soil which prevails in Southern Illinois, and which I judge to be not unlike the "barrens" of the center and north, in its fruit-

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growing capacity is the best; but nearly all will answer, that is on a site otherwise adapted to orcharding.

3. *Preparation of Soil.*—I think that for the present, at least, nothing more than good, thorough, deep culture will pay; sub-soiling will prove remunerative; under-draining will not, until land is worth more per acre than it is now in most sections. The double Michigan, or Mapes' sub-soiler, after a common plow, is the best present prescription, I think, for orchard land. I think it better, if possible, to leave a dead furrow where the future row is to be, and then, by a second plowing, to throw up a ridge over it.

4. *Planting* should be done in the fall or spring, as most convenient. It is better, probably, to have the trees dug, shortened in, and root pruned, in the autumn, whether set out then or only "heeled in." If, as Mr. Lindley tells us in his "Theory of Horticulture," the roots of a plant, when not frozen, "are perpetually attracting food from the earth," it seems rational that the result of this process would be more satisfactory if performed under the altered conditions which must accompany the plant during its growth in the following summer. It seems probable that a tree left standing until spring may gather more food than the shortened-in branches can well receive, or the shortened roots continue to supply, and thus a double shock be given to the vitality of the tree, which fall digging would avoid. But this I leave for more experienced horticulturists to decide. I would plant trees, for convenience in cultivation, equi-distant in both directions, and at the distance of 30 or 33 feet in Southern Illinois, and perhaps 20 to 25 feet on the prairies northward; I have not yet tried the experiment, but am of the opinion that even in Egypt it might be found profitable to plant at 20 feet distant, and then cut out three-quarters of the trees, when twelve or fifteen years old, leaving the remaining trees 40 feet apart. In finding the places of the trees, I first find the outside rows all round, and the places of the trees therein; the inside rows, of course, must conform. If the orchard is to be a square of 20 trees each way, for instance, I would first fix the place of a corner tree, and the direction of a side therefrom, and measure off 38 rods in that direction, marking each two rods, by driving down a small stake, that would give a new corner, and a base for further operations. I would then measure from each end of this base line, and at right angles to it, in the direction I wanted the orchard, driving down stakes as before; this would give two more sides and the two remaining corners, which, if in the right places, would be just 38 rods apart. If not so, I would correct the error by giving half to each of the two sides last found, and changing their direction to conform; having these right, the fourth side is found, and can be staked off in the same way. From these outside rows of stakes, the place of every tree in the orchard can be readily found, either by sighting or measuring from a stake to its opposite; if you measure, always *measure in the same direc-*

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tion. Then dig the holes of sufficient size to take the trees' roots in readily, and we are ready for planting. Do not take out the stake to dig the hole, but keep it driven down with the back of the spade, that you may know the exact place of the tree.

In setting out, I would prefer to keep trees of the same kind and the same season together, either by rows or squares—the earliest nearest the entrance to the orchard, the latest farthest off, to avoid knocking off later fruit in passing to earlier. I cut off any broken roots with a smooth cut under and outward, and shorten in the branches in proportion to the amount of roots by a smooth cut outward, and slanting up just above an outside bud. I would give the tree its own way as to the hight of its head, which I think will give, generally, a trunk of from three to four feet. If exposed to high winds, a lower head might be made than in a more protected situation. We should guard against going into extremes. Admitting that low heads are more quickly formed, more accessible, shade the trunk better, and are less racked by winds, we must also bear in mind that they are more difficult to cultivate, and will have more unripened and uncolored fruit.

The tree being ready and the hole deepened or filled up so as to bring the collar of the tree even with or a little above the surface, I pull out the stake, place the tree where it stood, and, holding it upright, have another person pour mellow earth over the roots, straightening out any bent roots, and occasionally shaking the tree, without raising it, to settle the earth among the roots, until they are covered. I set up, while the hole is filling, a couple of good white-oak stakes, about two and one-half inches square and five feet long, on the southwest and northeast of the tree, the former of which protects the trunk from the sun's rays in the hottest part of the day, and both of which, where the orchard is square with the cardinal points, protect from the singletree of the corn plow, running north, south, east or west. I fill up the hole even with the surface, then press the earth down around the trunk enough to hold it firm until the earth settles, and then put on loose earth again, filling up an inch or so above the collar. Mulching I find beneficial in the late spring planting, and in fall planting a cone of earth around the tree would probably be useful in Northern and Central Illinois.

5. *Culture.*—Indian corn is the best crop, I think, to cultivate with apple trees. It insures frequent plowing and shade, while the trees are young, and pays, in part, at least, the expense of cultivation and use of land. Besides the incidental culture they receive in this way, I dig about the trees inside the stakes with hoe or spade, once or twice during the season. I prune a little, generally in the winter, as the most convenient season, taking out cross limbs and sprouts. I am inclined to think that with trees of slender and inordinate growth, shortening in could be practiced with benefit to future gatherers of fruit.

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The corn crop may be continued as long as it can be profitably grown, say five or six years, after which the orchard should be regularly cultivated by stated plowings, to keep up a regular and even growth. The frequency of cultivation depends on the varieties planted. The Early Harvest and Newtown Pippin need high culture and occasional lime and manure. The Raule's Janet is apt to crack open if the trees are cultivated over much.

6. *After Management.*—Yearly pruning, occasional plowing and manure once in five or six years, will keep the orchard in good bearing and growing condition. Yearly washings of the trunk and larger branches with soft soap or sal soda and water will pay, I think, in health and handsome appearance, and will guard against insects. The latter pest, however, from my own experience, I am inclined to think only a consequence of diseased trees, and to be best guarded against by health in the trees.

II. Pear Orchards.—Pears are things we talk more of than we know, and the glorious uncertainty which attends their culture makes it almost gaming with nature. Their cultivation is not yet understood, and I will venture a few remarks.

Selection of Trees.—I should want healthy, hardy stocks, from native pears, not subject to blight. Quince stocks are no object in a State the size of Illinois. I would like them budded and one year old, with low heads and healthy bark and leaves. As to kinds, the following is as good a list as can be made out, I think, at present, for the entire State:

1. Doyenne d'Ete,
2. Bartlett,
3. White Doyenne,
4. Flemish Beauty,
5. Louise Bonne de Jersey,
6. Seckel,
7. Winter Nelis.

More native pears may be found expedient hereafter. In Southern Illinois we would add the Duchess d'Angouleme to the list, and, perhaps, the Bell Lucrative would suit the whole State.

The same general rules as regards *location, preparation of soil, planting, culture, and after treatment*, will apply to pears that we have given concerning apples, with some modifications. The soil should have plenty of clay in it, yet not be wet. The trees should be planted twenty-five feet apart. They should neither be pruned nor cultivated so much as apples.

As to the blight, when doctors so wofully disagree, it is best to say nothing, save that an ounce of prevention is worth a pound of cure, and that we can probably do more by a careful selection and

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touched by the pruning knife, are what I would prefer for trees. As to varieties, there is a good deal of difference of opinion. Names are much confused. A peach suitable for one purpose will not be for another. Some very excellent varieties for family use will not endure railroad carriage. The following varieties are found in every list, and may constitute a nucleus:

1. **Large Early York,**
2. **Early Crawford.**
3. **Late Crawford.**

The following list would find many friends in this section:

1. **Troth's Early,**
2. **Large Early York,**
3. **Early Crawford,**
4. **Bergen's Yellow,**
5. **George Fourth,**
6. **Late Crawford,**
7. **Old Mixon Free,**
8. **Smock,**
9. **Heath Cling.**

This is for market purposes. The Grosse Mignonne, Morris White, and the Rareripes, might be added for family use.

Location.—The peach being the most tender of our common fruits, special attention must be paid to the location. First, it should be as high as possible, with a northwest aspect, and, if possible, a sheet of water to the west or north-west. The soil best suited is a sandy one, says Dr. Warder. Hollows leading out north and west should be avoided, as the winds blowing up them may prevent the natural down-flow of cold air, and cause injury by frosts.

Preparation of Soil.—The same as for apple orchards.

Planting.—The trees should be taken up in the fall,* (the roots trimmed and the limbs shortened,) heeled in carefully and set out in the spring twenty feet apart. Dr. Warder recommends cutting the entire tree off "boot leg high" when setting out—a doctrine from which I respectfully dissent. I would prefer to shorten in, severely, reducing the tree to a leader and laterals so as to avoid forks as much as possible.

Culture.—This should be nearly the same as for apple trees. Corn, however, can be only raised to advantage for two or three years—the trees being closer together, and making a much more rapid growth than apple trees.

After Management.—There should be annual prunings and "shortening in," according to Downing's method, by cutting off every spring from half to two-thirds of the last year's growth. Dr. Hull, however, is of the opinion that shortening in is not necessary in the West. A yearly application of air-slacked lime, leached ashes or tobacco stems should be made to the roots of the trees in spring to keep off the borer. The fruit, if not sufficiently thinned by pru-

*In addition to what I have said concerning fall planting, I would add a quotation

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ning and shortening in, must be thinned, if you would have the finest, to one on a twig, and that, says Mr. Starr, should be the one nearest the base of the twig.

In a brief article like this, much can only be hinted at or left unsaid, and the reader, for futher information, must be referred to the many and ample sources of information existing in the pages of our fruit books and farmer's papers; in the practical discussions of our horticultural societies, and in the instructive conversation (as I have found it) of our genial horticulturists, beneath the shadow of their own vine and fig tree.

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MARKET GARDENING.

By Dr. H. Schroder, Bloomington, Illinois.

I have the pleasure again to address you on the very important subject of Market Gardening. Much has been said and done already on this subject, but there is always something new.

A market garden should be always located, in order to make it profitable, near a large or compactly built city, in order to bring your products fresh and nice to market. Vegetables are only wholesome if they are in a fresh state. Some of our vegetables—for instance, say green lettuce and green peas—are dangerous to our system in summer time, if they are kept unused for six or twelve hours in day time. Market gardens may also be located near railroads, where you have the chance to gather your garden products late in the cool evening, and transport them in the night, or early in the morning, in order to have them sold before the day gets warm; but then they are less profitable, as the transportation of the manure will eat up a great deal of the profits. Manure is a very essential point in market gardening, and without plenty of manure there is no market gardening.

When a market garden is near a city, industry will always obtain the different kinds of manure or stimulants. The manure from the livery stables—from the poor laborer's cow up to the nabob's fancy horses—the sweepings of the streets, the cleansing of the gutters, the decay from the different waste articles of the hotels, the shells of the oyster saloons, the tan-bark of the tanner, the ashes of the soap factories, from the mills, steam powers, or other factories—the ashes of the poor and the rich—even the sweepings of the whisky and lager beer saloons, will give the market gardener the very elements for his business. Therefore is the location of a market garden best near a city.

The land for a market garden should lie on tolerably high ground, in order to have it thoroughly drained. Stagnant water must be avoided. Late frosts in spring, and very cool nights, work great injuries to market gardens, and this can be avoided by having your land on high ground.

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A good market garden should be surrounded by a good hedge, or a belt of evergreens, in order to break the strong winds.

Market gardens should have a certain number of hot-beds, depending on the amount of early vegetables and plants you can sell. This way, the fresh horse manure is used twice: once in using only the heat created by the gases of the manure in the hot-bed; after that, the manure taken out of the hot-beds is the very thing for the growth of the most of our vegetables.

The ground of a market garden should be trench-plowed and sub-soiled, very deep, every fall and spring. The more the ground is plowed and mixed with the manure, the better it is. Deep furrows should run through the garden, to let the surplus water off. If the land is plowed in the fall, ashes should be spread very abundantly during the winter, when the ground is frozen on the surface. Thousands of insects are killed in this way, while the alkali, on the other hand, will be of great benefit to the coming vegetation.

The best garden soil for most of our vegetables and small fruits is a dry, sandy loam, with a loose sub-soil. There are fewer insects in such a soil than in the black prairie soil; besides, the former retains more moisture, and is therefore less subject to drought, particularly if the land is plowed very deep, and drained. It will always pay to have a market garden closely under-drained with tiles.

A south-eastern aspect is always best for a market garden.

Market gardens near large cities, where, almost always, help can be found, are profitable; and, as the business is very laborious, it should be. Hot-beds pay very well: about two dollars to the running foot, if the same are used systematically. A hot-bed 100 feet in length, and 6 feet wide, (the best width,) made 1½ feet deep with manure, will take, with the proper outside lining, 25 one-horse wagon loads of fresh horse manure. To begin by the 1st of March, for Central or Northern Illinois, lettuce should be the first crop. If the young lettuce plants are raised under one extra double sash, you begin to plant them six inches apart, each way, in your well-prepared hot-bed: that makes you 2,400 plants. After three weeks, by good sunshine, you can begin to sell your lettuce at four cents per head, which makes you nearly one hundred dollars. Line your hot-beds again with fresh manure, as you go along with selling your lettuce, and sow radishes; Long or Round Scarlet are the best. Sow them, give them air enough, and in three or four weeks you begin to sell them again. They will yield two bunches to the square foot, by proper treatment; and, at the low figure of five cents per bunch, will pay you sixty dollars. If you had prepared a little bed of one sash, by the 15th day of March, perfectly safe from mice, which very often trouble the gardener, and put in this bed fifty four-inch or five-inch flower-pots, wherein you planted some early cucumber seeds, (the balance of the bed you may sow

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with peppers and celery,) your cucumber plants will be ready by the time you begin to sell your radishes. Now, then, make a new lining of fresh horse manure around your hot-beds, spade the same shallow, put three or four inches of fresh soil, with a good deal of well-rotted manure, into the hot-bed, and plant, under every sash of four feet wide, two cucumber hills, with the plants in your pots, (without disturbing their roots.) In this way, you will have green cucumbers for market four weeks before they come in the open ground. In this way, you again raise one hundred dozen of cucumbers. They will sell for from fifty to seventy-five cents per dozen, if not more; and you have from fifty to one hundred dollars again. Early cabbage plants may be raised as the first or second crop in your hot-beds, if desired, or there is a market for the plants, which is almost always the case, and you will make it pay still better.

My market garden is located in the city of Bloomington, McLean county, Illinois. I have cultivated, in 1864, about eight acres, except four acres in strawberries. My soil is a sandy loam; some of the land is drained by ditches, the whole is subsoiled. The subsoil is clay. The most of the land was broken in fall of 1863, plowed in spring of 1864; then plowed by a good sized two-horse plow, followed in the same furrow by a deep tiller. As I planted grape-vines in rows eight feet apart, on one-third of the land, and the rows for the grape vines, where drained, the vegetables between the rows had the best chance to grow. The most I planted were potatoes. My best and earliest market potatoes were the Early York, next early, Prince Alberts, Buckeyes, Mercer, Pinkeye and Peach-blow. They averaged 115 bushels to the acre. The most of them were sold in the Bloomington market at an average of $1 25 per bushel. Next came cabbages. About two and a half acres of Early York, Winningstadt, Marblehead and Drumhead—about 4,000 to the acre. The early cabbages brought an average of $5 a hundred; mostly sold in Bloomington, some sent to St. Louis, but a good many fed to the cows and horses; a good many were buried for spring sale, and I cannot tell what they will bring. Half of the potatoes and all the cabbage were cultivated by the hand hoe. I will, however, recommend the plow and cultivator for potatoes. Of cauliflower I had one-half an acre, but they did not do well this year. Celery, one-eighth of an acre. The land for the celery was plowed very deep, then plowed in ditches four feet apart; in the ditches were thrown, three inches deep, rotten manure, stirred up with the plow again, and then the plants were set, and only twice watered. When the plants were one foot high they were banked up with the plow, and only little help with the shovel. They were banked up in this way three times, and in the fall taken up *with the plow*. This is a good and a cheap way to raise celery. Two large wagon loads full was the product of the one-eighth of an acre. They were sold in Bloomington at $1 50 per dozen stalks. There will be thirty dozen saleable, (as they are not all sold) and may bring $2 per dozen by the

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first of March. One-half of the land for the cabbage was planted first in peas, and then followed by cabbage. I sold thirty bushels of green peas in Bloomington at $1 50 per bushel; the balance were dried and threshed, and will bring about five and a half bushels of seed peas, worth $6 per bushel. The varieties were Tom Thumb, Strawberry, Bishop's Early Dwarf, Marrowfat, Imperial, etc.

One acre of the new land was newly planted in strawberries, and in order to shade them, white bunch beans were planted between the rows. They are threshed but not cleaned; will make about sixteen bushels, and may sell at $2 per bushel.

One-eighth of an acre was planted in onions, to raise the tops. They did finely, making about sixteen bushels of the tops, besides the old sets. I am offered $10 per bushel for my tops. The old sets were dried and planted in rows where potatoes were raised. This is, however, a trial, and I will report next meeting. I hope good results. I sowed about one-third of an acre in red onion seed. The land was spaded, and was before well manured, and kept clean by weeding by hand. They brought forty bushels, and were mostly sold in Bloomington at $2 per bushel.

Beets, okra, kohlrabi, carrots, radishes and cucumbers were raised, but as there was no market for them, the sale did not amount to much.

Currants.—From 2,000 bushes were made 500 gallons of wine or cordial, as there was no market for the fruit. Three pounds of sugar were put to the gallon. I think if the bushes all stood together, they would cover about two acres. I expect the cordial will bring $1 50 per gallon. The most of them were Red Dutch. If the fruit were sent to Chicago, it would have brought $1 per bushel free of expense. One hundred bushels was the amount raised.

Raspberries.—About one-fourth of an acre. They had a trimming and one hoeing, and I obtained about ten bushels; most all made up into sirup. Preserved and canned fresh—worth $7 per bushel.

Strawberries.—I raised most of them between the grape vine rows. I picked 526 bushels, worth about $3,000. I sold the most of them in Bloomington, averaging about $6 per bushel. They were all cultivated by hand with a garden hoe, and picked at two cents per quart.

Asparagus.—I have about one-eighth of an acre in bearing. The beds are spaded in the spring and covered every winter with rotten manure. They brought me, in 1864, about 50 dollars, selling in the Bloomington market at an average of 20 cents per pound.

Pie-plant.—One-tenth of an acre. Land spaded around the plants in the spring, and all the land covered with three or four inches of manure. I sold about $90 worth in the Bloomington market at 50 cents, on an average, per dozen bunches, of about six stalks each. Linnaeus was the variety most used.

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Hot-beds.—I had about 500 feet in length in use for vegetables. I sold lettuce, early green onions, radishes, cucumbers, cabbage, tomatoes, celery, and other early vegetable plants to the amount of $1,000, mostly in the Bloomington market. My cucumbers, however, were sent to Chicago by express, and brought from 30 cents to 75 cents per dozen.

About 400 loads of manure of all kinds were used, partly plowed or spaded under, but mostly for top dressing. The average cost is about 25 cents per load. The manure was hauled from the livery and other stables, and cleaning of the alleys and soap factories. As a good deal of the same was used in hot-beds, it is hard to tell exactly how many loads were used to the acre. It is also almost impossible to give the exact profit by the acre. Eight hundred days of labor were spent, at an average of $1 50 per day, making $1,200 for the whole garden, including the labor of myself and family. Taking it all through, the garden paid, clear of all expenses, about $150 to the acre, or about $1,800 in all.

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LAND DRAINAGE.

By Harvey M. Kidder, Evanston, Illinois.

Perhaps no subject within the whole range of agricultural discussion has received more attention during the last few years than drainage. For twenty-five years past, the most costly experiments have been made, not only to prove its efficiency, but to decide on the best and most economical plan of accomplishing the work. In regard to these experiments, and to the theories usually urged in favor of drainage, I shall say very little, but taking it for granted that a large proportion of the cultivated land would be materially improved by proper drainage, give simply an account of the methods usually adopted, and a few hints derived from experience that may be of advantage to those who propose to experiment or drain largely, as the case may be.

OPEN DITCHES.

These are of service in relieving land of surface water, preventing the flow of water from higher lands, and are quite indispensable as outlets for other styles of drains. Thorough drainage is seldom, if ever, attempted on this plan, on account of expense and the waste of land. The large sugar plantations of the South, however, are often surrounded and interlined with ditches of this class, the mains of which are sometimes large enough for small canals, but outside of the slave States I do not know of extensive drainage of this kind.

STONE DRAINS.

Where stone abound, covered drains are often made of ditches, which being partly filled with stones and covered with straw and soil, admit of a moderate flow of water. Except where stones are in the way, the expense of this method is for general practice.

MOLE DRAINS.

[illegible] making drains by drawing a mole of wood or

some instances, to make a drain of value. The machine by which these drains are made is called the Mole Ditcher, and is of so general dissemination that it scarcely needs description. It is composed of a straight beam of wood, with iron coulter of large size, to the bottom of which is attached the mole. A contrivance by which the coulter is raised or lowered at will completes the machine. The mode of operation is to drop the coulter to the depth decided on, into the outlet, and by a power usually applied with a capstan draw the machine in the direction the ditch is needed. The mole forces its way through the hard clay of the subsoil, closes the cut of the coulter, and so cements the sides and top by pressure (the best moles do not indurate the bottom) that in some few soils they are quite permanent.

Advantage.—The only advantage in this method is its cheapness, yet wherever a permanent and serviceable drain can be made by so simple an operation, it would be folly to adopt any more expensive plan.

Objections.—The objections to these drains are their liability to fail just at the time they are needed most, and at a season of the year when it is out of the question to replace them. For example, when there is a crop growing on the land. Again, the impossibility of obtaining a true grade for the bottom, of necessity renders them of little value wherever the land is uneven or the fall slight.

Cost.—The expense of mole drains varies from five to fifteen cents per rod, according to circumstances and the amount to be done.

TILE DRAINS.

After all that can be said in favor of any other style of drainage, tile drains are the only ones that can be relied on for thorough and permanent work in all localities. They are made by laying in open ditches a continuous duct of well burned tiles, which after being carefully protected, are covered with earth. The water in the soil, from superincumbent pressure, is forced into this duct at the joints of the pipes, and is carried away by the regular fall of the ditch.

Tile are made from any good brick clay, and should be thoroughly burned. There are three different patterns in use.

The Horse-Shoe Tile is without bottom, and is made in horse-shoe shape. It is fast going out of use. If laid at all, they should be placed on a board bottom. Even with all the skill and means at the disposal of the drainers, at the Central Park, New York city, a series of this style of tile drains was found to be filled and useless after having been laid less than a year. They were taken up and relaid, the last time on board bottoms, and since have done good service. I have many rods of horse-shoe drains laid in this manner, and they do excellent service.

The Egg-Shaped Sole Tile has of late years been much in use. The egg-shaped bore of the tile gives it name, and was probably adopted because, theoretically, such a cavity offers the least obstruction to running water, and enables a small stream to have more effect in cleaning out silt and sand than any other form of duct.

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Objections.—These are, that it is needlessly expensive, and from the fact that the tile must be laid on the sole side only, it does not always give full opportunity to fit joints in the best possible manner. Nevertheless it is a good form of tile. The most of my drains are laid with it, and give the utmost satisfaction.

Round or Pipe Tile.—These are perfectly round, and combine all the good qualities of the egg-shaped, with less cost to manufacture, and less liability to breakage. They give full opportunity for protecting joints. This is best performed by the use of collars or short tile of sufficient size to slip over the joints of the main tile, thus connecting the whole drain, making it equal to one continuous pipe. This plan is perfectly feasible, and is adopted in all drainage of light lands in England, and somewhat extensively in this country. I would recommend all beginners to procure round tile with collars. Whatever drainage I may do hereafter will be wholly done in this manner.

PLAN OF WORK AND SURVEY.

After having hastily reviewed the different styles of drains in use, it becomes necessary to decide which one shall be adopted, and on the plan of work for either. In any event, the first business of a drainer is to make himself acquainted with the true level of his land, and the quality of the surface and the subsoils, as these must be carefully taken into consideration before the plan of drainage is decided on. If the subsoil is of a consistent hard clay, the fall abundant and regular, and the outlet attainable without much depth of open ditch, one would scarcely be warranted in entirely overlooking the claims of the mole ditcher, and yet, excepting for single drains and exceptional cases, I would not like to give them a wide recommendation. If tile drainage is decided on, a careful survey of the premises should be made, and an accurate plat of the proposed drains drawn. This plat should show the length, the true direction, and the depth at different points of the proposed drains. In deciding on the position of the proposed drains, every advantage of fall should be taken into consideration.

OUTLET.

The outlet must receive careful attention. In most instances its location at a particular point will be made necessary by the topography of the land in the vicinity. If, however, there should be a choice in the position, it may be borne in mind that from any plat of extended drainage the outlet will furnish water for stock purposes nearly the whole of the year. The location of the drains being decided on and carefully staked out, the next thing to be taken into consideration is the digging. The outlet should be completed first.

TOOLS.

The tools now needed will be an ordinary steel spade, kept sharp, for taking out the first three or four spits; a long handled shovel to

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take up the crumbs of earth; a narrow spade, to take out the bottom; a long handled scoop, for leveling the bottom. If the subsoil is hard or stony, a pick-axe and iron crow-bar will be needed.

PLOWING.

The use of the plow has often been recommended by agricultural writers, for removing the surface and materially reducing the cost of digging drains. After a thorough trial in plowing out the surface, I am convinced that the plow loosens and makes it necessary to handle so much more soil than when the spade alone is used, that economy dictates that plowing should be dispensed with. In a hard or stony bottom, the use of a lifting subsoil plow may reduce the cost of digging, but in any soil where the spade can be used to the full depth, the increased size of the ditch, to enable the use of the plow, will necessitate such an amount of extra digging, as to more than counter-balance any advantage gained by plowing.

DIRECTIONS FOR DIGGING.

Ditches for the reception of tile should be only wide enough at the top to admit a man to work easily, and so narrow at the bottom that a man can barely lay the tile by walking backwards with one foot forward of the other. The width at the top must depend on the depth of the ditch. If we take three feet six inches as the minimum depth, two feet across the top would give ample room for an experienced ditcher. Such an one would hardly make it wider where the ditch was to be four feet in depth. The drains should be commenced at the outlet and opened up one spit at a time against the fall, and through the whole length of the ditch. As the top spit is taken off, the ditch should be graded as nearly right as possible, and care should be taken in each spading to correct the grade, should there be a necessity. The last spit must be removed with much care, for on this depends the work required to obtain an even grade, which must be done before the tile can be laid. The running water in the ditch has always been a sure criterion of the proper grade of the bottom, in my ditching operations, and without it I should be at a loss to know whether the bottom was truly graded or not. The facts are, however, that in the spring or late fall, ditches of proper depth will draw water enough to decide the level in nearly all soils of a clay bottom.

LAYING AND PROTECTION OF TILE.

The tile should be placed on the bank of the ditch within easy reach of the ditcher, and, at intervals, heaps of hay or bundled straw. The ditcher commences at the upper end, and taking a handful of hay scatters it on the bottom, treading it down. After filling the upper end of the first tile with hay, he lays it in its place, and then proceeds to form his duct by laying tile after tile, making each joint fit as closely as possible. To facilitate the fitting, he carries

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a trowel to cut off the rough edges, and break pieces to lay over joints. Having laid the duct a considerable distance, he scatters hay or straw over the tile to the depth of six inches, and then with a spade covers the whole with the soil last thrown from the ditch. Care must be taken in throwing in this soil, that it be made to strike the opposite side of the ditch near the bottom, and break the fall, thus protecting the tile from being crushed or moved from their places. Ordinary workmen then follow and fill up the ditch, or it may be plowed full.

DEPTH OF DRAINS.

The proper depth for drains in different soils is a matter of the utmost importance. If a drain at three feet deep would be, to all practical purposes, as efficient as one at four, it would be the hight of folly to lay one four feet, at nearly double the cost at which one can be laid three feet. Practice, however, proves that a ditch of four feet in depth is more than double as efficient as one of only three feet. My own experience is that in light surface soils, with tenacious clay bottoms, the drains should be placed deep enough, if possible, to enter the *hard* subsoil at least a foot. I have opened drains of one hundred rods in length, which, at three feet in depth, would not give water enough to lay tile by, that when sunk nine inches deeper, ran a steady stream of water for weeks. Judge French, the eminent writer on drainage, after reviewing the controversy on the subject of depth, in England, comes to the conclusion that four feet is probably the best attainable depth.

DISTANCES BETWEEN DRAINS.

The proper distance between tile drains must vary with the depth of the drains, the locality, the texture of the surface soil, the character of the subsoil, and the object to be attained. For example, one or two drains properly placed might be quite sufficient to drain a tract of light land, that was being kept saturated with water from a higher locality. Drains at sixteen feet apart and three feet deep, in some tenacious clays, might fail to be as thorough as drains four feet deep and fifty apart, on the loose mould and permeable clay of most prairie soils. On the level prairie, I have found by experience, that drains regularly laid out, at four feet in depth, placed once in eight rods, materially improve good corn soils, and where the drains are placed regularly, at once in four rods, their service is quite as apparent as when they are nearer.

EXPENSE OF DRAINAGE.

This will depend on the depth and frequency of the drains, cost of tile, and price of labor. A tile drain three feet in depth can be completed, in an easily worked soil, with labor at one dollar per day, for twenty cents per rod, for the labor alone. It will cost forty cents per rod to lay tile at four feet in the same soil. In the

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spring of 1860, I contracted with an English ditcher to dig the ditches, lay the tile and complete the work in one thousand rods of drains, at thirty cents per rod. In laying nearly the same amount of drains, in the spring of 1861, with labor by the day, I found that the expense was about the same. The tile, hay, expenses of outlet and surveying, are not included in this estimate. These expenses must be calculated at what they will cost where the drainage is to be done. The present prices for pipe tiles in Chicago, are for two-inch bore, ($8) eight dollars per thousand; two and one-half inches bore, ($12) twelve dollars; three-inch bore, ($20) twenty dollars.

WILL DRAINING PAY?

Numerous statements have been widely published of the material increase in returns in particular instances. Outside of my own operations, I cannot say. With me, after having drained forty-five acres, the results are quite satisfactory. I have harvested from a piece of land which had been heretofore, not only unprofitable, but expensive, which was plowed in May and drained in June, a crop of grain heavier in berry, and with a yield per acre larger than any ever before harvested on my farm. The fields drained have all been improved in texture, and the returns promised are satisfactory.

CONCLUSION.

Let no one resort to drainage in the expectation that it is the panacea for all the troubles of cultivation. Drainage will never make up the deficiencies of careless or wasteful farming. It is, nevertheless, one of the first steps, in any system of high cultivation, where, after disposing of the surplus moisture, it only affects the soil by enabling it to turn the results of labor and fertilization, to a higher account than it possibly can in a natural state. At low prices of land and produce, *extended* tile drainage would not pay the interest on cost. Yet, on nearly all valuable farms, there are tracts of naturally fertile soil, that require drainage in order to work the adjoining lands to advantage. Wet sloughs near farm buildings, which cost as much for fencing as the most available land, are not uncommon. Such cases evidently demand and will pay for drainage. As civilization moves on, and land is required to increase in scope and quantity of productiveness, in order to keep up with the demands made on it, drainage will assume a more important part in agriculture than is now anticipated.

Already horticulturists concur in the fact that drainage is necessary in order to attain any surety of success in fruit growing. Acting on this principle, nearly all of those most prominently engaged in this business, throughout the whole country, have been draining their lands with this end in view. The principle is of equal application, for all who would grow fruit or the finer products of the soil on any scale for their own convenience or profit.

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IMPHEE AND SORGHUM CULTURE—SUGAR AND SIRUP MAKING.

By J. H. Smith, Quincy, Illinois.

The public mind is now in a condition to give a fair trial, and a more full investigation, to the real value of the Chinese and different kinds of the African or Imphee canes. For the last two years, the position of our country has been such, that it has naturally led us to new and persevering investigations of what our soil and climate will produce, north of Dixie.

The circumstances surrounding us have undoubtedly inspired a more thorough examination in the analyzation of these plants, so lately introduced into our country. Every observing eye can see the marked progress, for the last seven years, upon the estimate and confidence the public mind began to have in these new and valuable kinds of canes, which have already given four-fold to the exertion of the farming community, and that the products of the cane will become one of the great staples of our soil; for it has already entered into commerce and trade, like pork, flour, etc.

Yet, comparing ourselves with the Southern producers of the articles of sugar and molasses—how they struggled for long years before they became masters of the culture and manufacturing of sugar and sirup—we will be proud of our advance; and as yet we are, in a great measure, in the dark, as to the many improvements we must make upon the merits of these new plants.

The Government, in its late policy upon agricultural interests, deserves some praise for the efforts in introducing to the farmer new seeds and plants, which will prove advantageous, and add to the wealth of our nation.

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in order to yield their utmost capacity, for the labor bestowed on it. It is not the hap-hazard cultivator of the soil that reaps the greatest reward—so he may accidentally chance a rich harvest; but he who knows best when to plant, on what soil, or the food most congenial to this or that plant, the labor necessarily bestowed on it, all work together for the great result.

So far as I have been able to observe, the two distinct canes—the Chinese and the African varieties—are very similar in habits and wants. The Chinese is from the north of China, and the Imphee is from the south-eastern coast of Africa.

There is only one kind of the Chinese cane known to us—that mysterious country from which it comes having kept itself excluded from the rest of the world—and we are as yet in darkness as to the many valuable plants they improve, and as to other of their improvements and culture. But since her gates have been opened, this plant, in particular, has come forth to interest the American farmer.

It may not be improper here, briefly to state how the Chinese cane was introduced into Europe, which was sent by Count de Montigny to France in 1851, at which time he was French Consul at Shanghai, in China. In compliance with an official request of the Geographical Society of Paris, he sent a collection of plants and seeds, which he thought would succeed in his country, and among them this celebrated plant, which we now cultivate in America. It is a curious instance, that as sometimes upon the slightest thread most momentous results depend: so, in this, when we consider, that of the package of seeds sent by the Count to Paris, one only—one single seed—germinated in a garden at Toulon. If perchance that one plant had been destroyed, France and America would have been without the Chinese cane, and perhaps, for an age, we might have been deprived of what will become of untold value to this people.

The small experiments and the minor efforts made, and the rich results obtained—the remuneration it gives to the experimentor—ought to encourage even the doubting capitalist to largely invest in buildings and machinery, that a full compensation may be had from the culture of the cane, and the manufacturing of sugar and sirup therefrom.

The Chinese cane is a very lofty, high and well-proportioned stalk, with a graceful, bushy, bowing top. The seed is of dark purple color—almost black. The only difficulty with the Chinese cane—it being more slender than the Imphee—is in the strong prairie winds, which bend and break them down; and when once broken or badly bent, will not make good sirup. This cane, injured in any way, changes the color of the sirup, and gives an acid taste to it. The Chinese cane has never yet yielded as much sugar as the Imphee varieties; but it makes a more pleasant sirup, and it is by far more free from acid.

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The Imphee cane was introduced from the south-eastern coast of Africa. Mr. Wray, of England, tells us that there are sixteen different kinds of these canes. The Imphee introduced by this gentleman are truly superior for sugar making; their crystalization is of that desirable coarseness so much coveted in sugar, while that of the Chinese cane is of a floury texture.

The marked distinction between the Imphee and what is called the Chinese Sorgho, in the relative value for producing sugar, is particularly to be observed. The Imphee gives about seven-tenths sugar, while the Chinese gives only about two-tenths. The Imphee is much more limpid, and far less mucilaginous—which our farmers term "white-glue scum"—than the Sorgho juice: consequently it crystalizes more easily; and we believe that there is as much sugar in the Imphee cane as in any cane raised in tropical climates. We have taken from one gallon of mush sirup, weighing thirteen pounds, eight pounds of sugar, and of as coarse a grain as any of the Southern production; and if of such a quality, why not refine it into the best sugars the market demands?

We have found a difference with the same canes, grown upon the different soils. Soil and manure determine the quality of sirup and sugar. We have made it our diligent study to understand what soil or manure to use for these plants, that they may give us a return for our labor.

SOIL.

It is not always that the best-looking cane yields the most. The farming community generally plant their cane upon the richest soil. But many have already, by experience, been taught that this is a sad mistake; and the inquiry among those—at least many—is, what portion of the soil is best adapted to the cane, and on what soil can such cane be raised, that will yield the best sugar and sirup?

These plants have originally grown upon a loamy, brown, sandy soil: such a soil will be natural to supply their wants. We have obtained our best flavored sirups grown upon this kind of soil, and in fact it yields a more healthy and strong granulation; yet we are often deceived in a strong, rank, healthy-looking cane; for when we apply the test of the saccharometer, we find its weight only five to six, Beaume, and will take ten to fourteen gallons of juice to make one of good sirup—weight forty: hot: Beaume. This kind is in general full of woody, spongy fiber. But cane grown on poor, sandy soil will weigh ten to twelve, Beaume, and five to six gallons of juice will make a gallon of good sirup.

Experience has taught that virgin soil will produce a luxurious growth; but it is too often as deleterious, in regard to its saccharine quality and crystalization, as the flat meadow soil. High, rolling timber soil, no matter if worn out as to common crops, if sub-soiled, is well adapted, as the plant will dive down for its sup-

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port. It is not uncommon to find its roots as much as six to eight feet long, and they will feel for the silex, and that which will give them the most natural food. Such soil is almost equal to the sandy, and will return a good crop of sirup and sugar. If the land is weak, thirty bushels of lime and one-half bushel of salt to the acre will fully compensate for the outlay. Soil on which a good crop of Indian corn can be raised will produce a paying crop of cane. Flat clay or meadow lands, if under-drained, will answer; but as a rule, all dry soil, and more particularly a dry and droughty season, will produce the best cane. It never suffers like our common corn. A wet season gives too much water to the stalk, and although it may yield a large portion of juice, yet it will run as low as five to six, Beaume. Dry soil and dry season make a good crop certain for these plants.

I do not say too much when I assert that too little is known by our farmers about the different manner of manipulating and preparing the soil, and manuring the same; and it is this which will best insure a return in the enterprise of the raising of the cane, and the manufacturing of the sugar and sirup.

On a piece of ground worn out and unfit to raise any other crop, we have this year plowed ten inches deep, and, well cultivated, we have raised on it the best crop of cane in the neighborhood. It measured 11½, Beaume.

SUB-SOILING.

For these crops, above all others, deep plowing and thorough pulverization pays well; for the cane seed, when planted, very often lies from three to four weeks—and we have known it to remain six weeks—before it shows itself. In looking to the root, it is found about six inches in length before it makes its way to light; and thus, if the ground is well pulverized, the infant and tender roots will lay hold of the mold, and, without any obstruction of clod, will strengthen, and gain vitality and hardiness. It is not a tender plant, as supposed, but as hardy as a cabbage plant; and they may be transplanted with a certainty of thriving. The root of this plant does not skim on the surface, like our Indian corn; thus the upturning and mellowing of the soil is all to its advantage, and it gives life and strength to the plant.

SEED.

In preparing the seed, previous to planting, we make a solution of warm water, consisting of chloride of lime and water—say one ounce to the gallon of water. In this deposit the seed, and let it remain twenty-four hours; after which, place the seed in a bag, and bury the same in the ground, in a sunny spot, and let it sprout through the bag. Then uncover and plant your seed, thus sprouted, in rainy or dry time; cover lightly, and in a few days the plant will make its appearance. It makes at least twenty

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days' difference in planting the seed thus prepared, instead of sowing the seed dry, without soaking or sprouting. The hull of this seed has a close texture, and, the ground being dry, it takes a longer time to swell and break its shell, or germinate.

It generally gets a good hold, or its sprout or root gets to be five to six inches long, before it makes its appearance to light. On its coming up, it looks weak and sickly, and is hardly to be distinguished from the wild grass, commonly known as "fox-tail." Although weak and feeble looking, yet it is a hardy plant, and no loss by transplanting.

PLANTING AND CULTIVATING.

Plant as early as possible, or as soon as the ground is prepared in good order—say from the 15th April to the 15th May. We planted some this season as late as June, but it did not thoroughly ripen. As already stated, cover lightly, lest the seed rots.

We have usually drilled two and three inches apart—four feet the other way. If the ground is not free from foul vegetation, plant in hills, four feet apart each way. The cane does not need hilling, like the Indian corn, as it has no roots or feeders coming to the surface to be covered. If, in early planting, the frost nips it, it will live and make a good crop. Cut off the dead part, and it will soon come out bright.

There are many who sow the seed broad-cast, like hemp, and in this way have produced 500 gallons of good sirup to the acre. We are trying it. It may be well to plant, with the cane seed, some radish seed, as this latter comes up first; and if you have to cultivate, or desire to do so, before the cane has made its appearance, the radish will guide you, and thus enable you to destroy weeds which may have become noxious to the cane; and thus the tender plant will be enabled to see light.

Cultivate, therefore, as early as possible, lest the weeds get too much the start. Cultivate in the same manner as the Indian corn. In first plowing, a little more care is required than with corn; but however much more labor is spent on it at first, it requires, afterward, not as much care as the Indian corn.

The Chinese cane often produces from ten to twelve stalks from one seed, and one is just as good as the other; in fact, the smaller canes are the sweetest, and we have not thinned out, but let all ripen for harvest. We put from six to twelve seed in a hill. The Imphee canes, as far as we have found, have never produced more than one stalk from one seed, and believe it does not stool like the Chinese.

MANURING.

Soil highly pregnated with ammonia prevents the crystalization from the cane, and horse, hen or pigeon manuring are very detrimental, and produces the same effect. Bagasse or crushed cane is

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an excellent manure; and until it is known what manures are best suited, it is better not to manure at all, than to add something which will have the contrary effect to that sought to be produced. We have used ashes, lime, plaster paris and salt—all of which have added to the growth of the crop, and effected a healthy and profitable granulation.

As we have to depend entirely upon experimenting to learn and determine what is beneficial to this plant—what are its wants—it is very natural that many must meet with disappointments; for, however successful we may be in raising a fine crop, our manipulating of the juice, the boiling of the sirup, and making the sugar, depend upon so many eventualities, all to be learned, that it is astonishing that, with so many drawbacks, such important results have already been obtained. Were it known to us how these plants are treated in their native places, many desirable results might be obtained in following up the same course; and if the Agricultural Department of our country at Washington would deem it of as much importance as this is bound to be, some responsible agent would be selected, who might visit those countries, and obtain the information needed; and the outlay would be a trifle, compared to the results.

HYBRIDIZATION.

There is but little doubt that the Chinese cane has given birth to our broom corn. We have often been cautioned against planting cane contiguous to a broom corn field, and, by so doing, it may hasten the deterioration of the cane; but we have this fact: that, whether planted contiguous to a broom corn field, or whether there is not such a one within ten miles of your cane-field, plant the same seed five years in succession—they will most likely run thus: The first year, they will measure or weigh ten to twelve, Beaum.. the second year, seven to nine, Beaume, and the third year, so reduced as to weigh only from five to seven, Beaume, with an intermixture of already many a stalk of broom corn; the stalk becomes spongy and dry; and lastly, not a particle of saccharine juice can be detected, and the brush of the stalk is almost equal to the broom corn. May not this be the proof of its natural tendency?

We do not apprehend the danger of hybridizing from the Imphee canes, as we have not as yet found any tendency from the variety of Imphee kinds, after a culture of four years. But so much we have, by experience, found: that the Imphee cane hybridizes with its own kinds; and we are not yet fully prepared to state whether or not they will hybridize with the Chinese cane.

We have planted two kinds of the Imphee canes in alternate

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made repeated trials, and found no less saccharine matter in the cane than is natural to its kind.

HARVESTING.

With a large crop, it is admissable to begin when the cane is in the blossom, it makes good sirup, but more difficult to divest it of the cane taste. It will not produce as much sirup as when fully ripe, but it will not make sugar till the seed is in the dough.

Try the different portions of the field, by applying your saccharometer, and it will be found that portions ripen sooner than others, as we have measured in the same field parts from 5 deg. to 9 deg. Beaume, and by these indications were enabled to commence at the ripest, or those which measure the most. If not endangered by early frosts, let the crop remain as long as possible, but if hurried by this enemy—for it is one of the most dangerous ones—cut the whole crop, blade, top and all, throw it into winrows, and cover with straw, or, if on hand, with bagassee, so that it will not freeze and in turn thaw in one day. It is best to strip the leaf and top the cane just below the first joint, and put it under a shed near the mill, so as to prevent it from souring, occasioned by the sun, heat, or even cold.

If the frost nips the cane, it has this effect, it drives the sap from the blade and shuck into the stalk, which shuck and blade has a very bitter taste, like nut-gall—and this it is what produces in sirup that taste so often mispronounced scorched, which is not the case, as it is only that taste produced by said cause, and is very difficult and seldom if ever fully removed.

When ready to harvest, strip the blades from the stalk and top the cane, as already stated, and strip and cut no more in a day than cut, crush and press the juice, in this way you will avoid any souring, and also preventing the imparting of a bitter taste to the sap in the stalk, which is thereby produced, and which also imparts to the sirup the so-called scorched taste, and therefore quick work will find its reward. On prairie grounds, where the winds very frequently sweep down, bend or break the cane; if not immediately after worked, they will be of little value, for after having remained in those positions for a while, the cane is unfit to make good sirup.

When the cane is ripe, it should be cut, and placed out of the sun, for so long as the stalk is connected with the roots, there is a circulation that after being ripe deteriorates from the flavor, quality and quantity of the sirup.

In stripping cane, use a common corn knife. One man can strip an acre per day, if he has not to save the blades. In cutting, put the cane in bundles from 20 to 30 stalks each, tied in two places, which in all cases very much facilitates the handling, bringing to mill, and the handling at the mill. If the cane being

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ripe, cut and housed in order to keep from frost, it can be kept a long time—up to December—and will rather improve, and we had some which has measured as high as 14 deg. Beaume. A dumping cart is very useful in handling the cane, and will save labor.

MILLS.

These are one of the most important items in this business, because, when that perchance fails—and is generally at the most needed time—then all the labor has been thrown away. Very much is yet needed to make those heretofore manufactured desirable, for there is no time to mend and repair when the work is once begun. The capacity of the mill ought to be according to the crop intended to be raised, or to the business enterprise to be carried on. For a crop of twenty-five to thirty acres of cane, a mill is needed that will press 150 gallons per hour, unless you run day and night. We have used Clark's, of Cincinnati, and we are looking for one that must do better yet. The expense to press 250 gallons of juice per hour is not any more than to press 150 gallons per hour, as the hands will tend to it, and is only in the capacity of the mill. The expense is only in the mill, and though those of a larger capacity naturally cost more, yet it is better to make the outlay, and it will be a saving in the end. The small mills may, perhaps, make 40 gallons of sirup per day, while those comparatively but of trifle more of expense will make 150 gallons sirup per day.

HANDLING THE JUICE.

We use a tunnel sieve, which is placed under the spout of the mill to conduct the juice to the filterer over the pan, so that it is not necessary to handle till it passes into the evaporator, where you concentrate the juice to 15 deg. Beaume, at which heated point we pass the juice through three filterers, consisting of three of tubs set directly over each, their shape being conical, three feet wide at the top and two at the bottom, and three feet deep, the bottom of these tubs being perforated, and having also a flannel bottom in the same, resting on bars, filled with bone black or animal charcoal, the filterer so placed that in turning the cock it runs in the last concentrating pan; when there drive the fire until the saccharometer indicates 40 deg. Beaume; run into your large flat cooler—that will hold about the labors of the day—so that the sirup will be about two inches deep in the cooler, as it is more liable to scorch there than over the hot fire, as while there the boiling commotion and stirring prevents it from scorching.

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juice, after ten minutes settling, having your cock so fixed that it will leave all sediments at the bottom; then renew your fire with vigor, and concentrate the juice to about 30 deg. Beaume; keep it at that grade, by moderating your fire, until you bring it to about 40 deg. Beaume—or, if you judge by the eye, you will see short, golden puffs escape, or in dipping your skimmer in the boiling fluid, it will drop short and heavy—the sirup then is done and ready to run in the cooler, and any eye will soon get the experience to see when the sirup is ready to be run into the cooler, or when the sirup and sugar are done; allowance must be made for the weather, when hot or cold, day or night. To perfect and hasten the granulation of the sirup, a room, heated to about 95 deg., is needed, and should be kept so after it leaves the pan.

EVAPORATING AND CLARIFYING.

Cook's Evaporator clarifies and makes the sirup and sugar without the aid of another pan, or the assistance of any chemical agents, and they are more to be preferred for a small business than any other pan we are acquainted with. But if you use a pan of this style, you will need two—a pan 25 feet long, the width of the sheet-iron 28 inches, 3½ feet at the top, it being made flaring; the pan having three divisions, set upon a continuous brick arch 15 inches wide, letting the fire hug the bottom of the pan close, and thus you will find you can make 100 gallons of good sirup with one-half cord of wood. But for this pan you need another, as before described, which is to take your strained sap and clarify it, before using the long pan, and this clarifying pan will keep the long pan at work.

If fine sirup is desired, run you clarified sap (hot) directly into a filterer—say a tank of seven feet high and four feet in diameter, with perforated bottom. Twelve inches from the bottom of the tank fix a cock to turn the juice on to the pan. Upon the perforated bottom place bars, and on them put a flannel cloth to keep the dust or coal from mixing with the juice. Now put in four feet of animal charcoal or bone black, then spread a cloth upon the top of that coal, and put two feet of wood coal, about as fine as the kernel of corn, and let on your hot juice, and when you are ready to start your finishing or long pan, turn the cock and take the filtered juice as you may want it. The small filterers described before are filled like the large, but with animal coal only.

SCUM.

All scum, till the juice is to about 15 deg. Beaume, is useless, except to feed stock, and they are fond of it. The green and more filthy scum being thus disposed of, it is well to save all other scum in a separate vat or tank, which may be placed close at hand for the purpose, and at leisure, after it being settled, may be drawn over into the pan and reboiled, and thus it will give as good sirup as

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desired. It may also be run through the filterer, and the scum taken from them will make excellent vinegar. That scum and washings will easy make from 10 to 15 barrels of vinegar, where 30 to 40 barrels of sirup are made. If something stronger is desired, good brandy, of high price, can be made from all these fermented saccharine juices. Forty gallons of it will make four of good spirits.

DRAINAGE OF MUSH SIRUP TO SUGAR.

This is the most difficult part of the labor; for it does not naturally drip dry, as the molasses all rises to the top of the vessel. The quickest and most successful way we have found is to put the mush into a coarse, strong bag, and put it on a strong hoop, like our portable cider mill hoop; then put it in the screw press, and the molasses, if the room is warm, will soon leave the dry sugar.

Another mode of drainage is to have a large table, twelve feet square, with sides four inches high, the center as high as the sides, and gradually sloping to the corners, where the spout should be opened, to carry off the molasses, hauling the sugar to the center, etc. If the room is kept warm, (95 degrees,) it will soon drain the sugar, and, in either mode, will carry off with the molasses any cane taste.

DISTILLING CANE JUICE.

Although the distillation from cane juice is entirely disconnected from sugar or molasses making, yet the cane juice may be successfully used in the distilling of spirits, and, as such, may become one of the most valuable articles of trade; and therefore, a few remarks on this subject may not be uninteresting.

It is known that when sweet cider ferments, and becomes hard and sour, it will make spirits, which is called cider brandy. If you measure the saccharine qualities of cider, you will find it to measure about seven, Beaume. Good cane juice runs from eight to twelve, Beaume, and, if permitted to sour or ferment, it will, by distillation, make good brandy. In speaking of fermentation or souring, it is not meant to sour like vinegar, for that does not produce spirits. A copper still, holding 300 gallons of juice, will make 32 gallons of brandy, worth from $2 to $4 per gallon. The manner of distilling, although some experience is necessary, yet is a very simple one; and those who have practically had experience in distilling apple and peach brandy, will very readily understand the manner of the distillation of the cane juice.

The only difficulty is in the observation that the juice properly ferments. For this purpose of fermenting the juice, it is necessary to use large vats, that will hold 100 barrels or more. In warm weather, eight or ten days will produce such fermentation as to be ready for distillation. Considering that not alone the fermented juice, but also the sour sirup, or even scum from the sugar works,

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may be worked into spirits, it will be perceived that the result must be profitable.

Corn, barley and rye have heretofore been exclusively used in this country for the manufacture of spirits. In Europe, grapes and potatoes have been and are constantly used for the same end; and if spirits are to be manufactured at all, as an article of trade, we unhesitatingly declare that cane juice will be found so profitable, for its manufacture of spirits, that before long it will enter as a grand competitor in this article of commerce, and be found, by farmers of the West in particular, to pay as well as, or better than, any of our home products now pay.

BAGASSE, OR CRUSHED CANE.

For fuel alone, this is one of the greatest items. A mill of any capacity will produce bagasse enough to evaporate all the juice crushed from it to either sirup or sugar. And we would recommend, for the purpose of burning the same, the following manipulation:

On the arch on which is the long pan, (of twenty-five feet,) make a side arch, with a flue to enter it, and so construct the side arch as to have a large door to it, to put the crushed cane in, by the fork full, and close the door. The fresh cane will make more heat than the dry; therefore it is not necessary to wait for the same to be dry before using. Having two arches, you can feed wood or bagasse; and if the chimney is high enough, there will be no trouble about draught. We have seen the flames passing through the twenty-five feet long arch, and pass out above the chimney—that being twenty feet high—fed by fresh bagasse.

We learn that paper mills are using largely of the bagasse, for paper making. Of its value for the soil we spoke before.

SUGAR MAKING.

There can be no more doubt in the mind of any one, that sugar of the very best quality can be obtained from the Imphee cane. We have, ourselves, made this year four tons of sugar, which will very favorably compare with any sugar north of Dixie.

The small samples presented before the State Agricultural Society can be judged by every one who will only take the trouble to examine the same, and look into the merits it now possesses. The sugar has been and can be produced in large quantities, in ten days, from the stalk of the cane, and dried and ready for table use.

We are fully confident that we may so fit up sugar houses in Illinois, that they will present to the market such sugar and molasses as will favorably stand competition with sugars brought heretofore from the Southern States, Havana, or the West Indies. All that is required is to expend the necessary capital for the erection of suitable and proper buildings, provided with machinery well adapted for the purpose, and it will be capital well invested.

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That immense profits may be earned by such undertakings, there cannot be a shadow of doubt; and it is only to be hoped that capitalists may be so reached, that they learn the value of so investing their capital. Already one establishment of the kind has been erected within the State; and, though its erection cost $75,000, yet it has worked up, in this year, 800 acres of cane, that yielded 300 gallons of sirup to the acre. At fifty cents per gallon, this would alone make $120,000. Several thousand barrels have been shipped from this country, and some of it to Arkansas! Who would have believed this five years ago?

The success this year has inspired our farmers with more confidence; and no doubt, as we advance in the culture of the same, so we must naturally increase in reaping the benefits of so experimenting. The capitalists begin, though very slowly, to get interested in the making and refining of sirups and sugar. The Belchers, of St. Louis and Chicago, who are so largely engaged in the refining of sirups and sugar as to be almost the sole commanders of the Western markets of both named articles, are in the market, and have bought largely of sirups for their refinery; and we have no doubt that they reap immense profits. The fact that imported sugar sells for ten cents per pound, and refined as high as sixteen cents, speaks for itself, when the molasses from the cane could be bought for forty cents, and, when made into sugar, would reduce the prices so that these commodities would bring good profits at half those prices.

CLARIFYING JUICE.

There are different modes used to refine, filter and clarify juice. When using Cook's evaporator, we never used anything for clarifying, and made good sirups; but there may be successfully used, when the juice has too much of the acid taste, the following mode: After the juice has been brought to a boiling point, and the green scum has been skimmed therefrom, it is run into a tub or tank. Ten to twelve pounds of pulverized clay may be effectually used to fifty gallons of juice. Let it stand from five to ten minutes, when it will be settled, and draw it off in the concentrating pan, so continue to prepare, as fast as needed for the supply of the concentrating pan. The mode of filtering through animal coal, and the vessels needed therefor, we have already described; and that will, according to our experience, be found one of the best. Either the large or small tanks described will answer all the purposes, according to the quantity to be prepared. We have also often filtered through coarse sand. Bi sulphate of lime, or milk or cream

DESCRIPTION OF THE DIFFERENT CANES.

The Chinese cane—one kind only known to us—we have described fully. The African or Imphee canes—of which there are a number, and which, in general, seem to be more adapted to our climate, and to withstand better the prairie winds, than the Chinese cane—are shorter, thicker, and stubby stalk. We name prominently the "E-en-gha," as a fine, tall, slender and beautifully proportioned stalk; will ripen in ninety days; very sweet cane; large, graceful head; seed of yellowish hue.

The "Nee-a-zee-na"—the head somewhat bushy; the seed black, like apple seed, but full and plump; ripens in ninety to one hundred days; a very sweet and juicy cane.

The "Oom-see-a-na"—one of the best canes we have; yields seventy per cent. sugar, and is a very desirable cane, which answers fully to the title, "the best."

The "Boom-vwa-a-na" is about equal to the "Oom-see-a-na;" very jucy and sweet; it is a short, thick cane, ripens in ninety days, and in seed appears like the "E-en-gha."

The "Shla-goo-va" ripens in from three to three and a-half months; stands erect, with seed head, rather pink color; is a very sweet cane, and granulates well.

The "Koom-bu-na" is of small size; the cane never falls down; is one of the finest canes, and has often indicated 11, Beaume, in its saccharine quality; seed pink, on the red order, with very fine head.

We have a number of these stalks, which will be laid before the State Agricultural Society, and among them some of the most beautiful specimens of the Imphee kinds, which will undoubtedly interest those who have taken a particular fancy to this branch of agriculture.

In conclusion, I beg leave to remark that I do not pretend, nor can I attempt, to discuss this matter upon its real scientific merits, but, as a plain and practical farmer, have drawn from my own experiments, and those experiments I have set down, and hope they may be of benefit to those who will commence to build up and aid in what undoubtedly must become one of the largest staple articles of trade of this State.

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CHINESE AND AFRICAN SUGAR CANE.

ESSAY ON THE CULTIVATION OF THE CHINESE AND AFRICAN SUGAR CANE, THE EXPRESSION OF THEIR JUICE, AND THEIR MANUFACTURE INTO SIRUP AND SUGAR, BASED ON THE PRACTICE OF THE AUTHOR.

By E. F. Newberry, Litchfield, Montgomery county.

Believing it wholly unnecessary to make any preamble concerning the importance of the subject, I shall, without ceremony, enter into its investigation; and

I. Climate.—Wherever Indian corn flourishes cane can be grown successfully.

II. Soil.—Too little attention has hitherto been paid to this most important point. Usually the richest portion of the farm has been selected for the cane patch. The result is a large growth of stalk, yielding juice very deficient in saccharine matter. Besides, such sirup will seldom grain.

The requirements of the essay forbidding the use of the experience of others, I will illustrate the truth of the above remark by relating my own. Most of my cane, for the last two years, has been grown on a prairie field of twenty years' cultivation—being of very ordinary richness to begin with. In some portions of the patch were "scalds." On these scalds the cane was of exceedingly small growth, but of a beautiful straw color, and the sirup made therefrom was invariably superior to that made from cane grown on the other portions of the field. Nearly all of it turned to sugar. A small portion of the cane grew on a strip of bottom land, very rich. The yield of stalk was enormous, but the sirup made from it was quite dark, and refused to grain. The juice did not contain over ten per cent. of saccharine matter, while that expressed from the cane grown on the scalds contained twenty per cent. These facts need no comment.

To my mill has been brought, during the last two seasons, cane from perhaps fifty different farms. Invariably that brought from

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the post-oak flats and red clay soil along the edge of the timber, has far excelled, in quality of sirup, that grown in the deep, black mold of the center of the prairie. The color is handsomer, the taste more pure and delicate, and it grains much more readily. Of course, the yield per acre is not so great; but no one in this case, I think, would suffer *quantity* to outweigh *quality*, as the yield, in either case, is enough to satisfy any reasonable man.

III. Varieties of Cane.—So far as I can hear, (and certainly so far as my own experience extends) the decision is in favor of the Chinese or Sorghum. I have, however, neither cultivated nor manufactured the Imphee or African to any great extent. I have tried four varieties—but one of which was at all comparable to the Sorghum. As I did not raise the seed, I may have planted inferior varieties, or they may have degenerated by mixing with broom corn. Be that as it may, the result, in my hands, has not been satisfactory.

I have *heard* of some few cases in this region where good sirup and sugar were obtained from Imphee. Its advocates claim for it speedier granulation. One man tells me that crystals were discernible as soon as the sirup had cooled. A brother-in-law made a sample of very choice sirup from one lot, but had no success with others. All that I hear, together with my own experience, confirms the belief that satisfactory results are far less certain in working up the Imphee than its *confrere*, the Sorghum. Another great objection to the former is the length of the season required to mature it. In this vicinity I know of no variety ripening as soon as the latter, although I see statements to that effect in the *Prairie Farmer*. Climate may, however, have some influence in the matter—the African maturing better in a higher latitude than the Chinese. Here (in latitude 39 deg.) the latter ripens from three to four weeks earlier. Future experience may, however, modify or even completely change my opinion concerning their relative merits.

IV. Selection of Seed.—Too much care cannot be taken to procure *pure seed*. Don't plant broom corn and expect to make sugar. The ease with which both varieties of cane mix or hybridize is much more curious than pleasant. This remark also applies to what is called "chocolate corn." Cane is not safe from the influence of either if planted within a quarter of a mile of them—I would rather the distance were much greater. The notion, however, that Indian corn will hybridize with it is wholly without foundation. Plants of *different species* never mix; different *varieties* of the same species *do*. Seed gathered from adulterated cane produces dry, worthless stalks. One man brought

broom corn was grown. All the seed grown from that cane has this year produced impure stalks. I planted none of it myself; several of my neighbors did. I could produce numerous instances of like character. These are sufficient, I presume.

Seed should be gathered from the first stalks that ripen, and especially from those lots which have produced sugar. It should be perfectly ripe, and when cut should be immediately tied in small bunches and hung up in a dry place. Only the upper half of the head should be used for planting, as the seed in that part produces more vigorous plants.

V. Time of Planting.—This will vary according to latitude and state of the season. Here, we can safely plant as soon as the 10th of April, and often much sooner. Mr. Raycraft, living within a mile of me, planted his cane, last spring, on the first day of March, on a strip of sheltered land. The ground afterwards froze four inches deep, and remained so frozen, more or less, during almost the entire month. Finer cane I never saw. The yield was the greatest of the season and the quality most excellent.

It may always be planted eight or ten days before corn; in short, as soon as the ground can be put in proper order; and as our manufacturing season is short, at best, every step which will hasten the maturity of the cane will prove of no small value.

VI. Preparation of Soil, Planting and Cultivation.—"Poor land well tilled," should be the maxim of the cane grower. Could the land receive a deep plowing in the fall, the gain would repay the trouble. The ground should be put in perfect tilth. The plant is weak at first and does not flourish amongst clods. It should be laid off with a marker, four feet one way and three feet the other. Having thoroughly tried all ways, I am convinced that as long as land is so plenty and labor so scarce, we had best abandon the drill system, except for very small patches. The latter plan produces a somewhat greater yield, but not enough to compensate for the greatly increased trouble of cultivating, stripping and topping.

The seed (using, as before mentioned, the upper half of the head,) should be soaked in warm water, twelve or sixteen hours, then placed in a sack and buried in some warm, dry soil, until it sprouts. Roll some dry ashes amongst it, if inclined to stick together. Drop from ten to twenty seeds in a hill; cover not more than an inch deep, and the work is done.

When the plants appear above ground an inch or so, a harrow with the front teeth removed, should be passed over the rows, and, if possible, the plants should receive a hoeing. The harrowing should be repeated in the transverse direction, some two weeks later, as the plants gain strength and size—one of these two-horse cultivators we read so much about would be just the thing. I have one—a very simple, rude concern—of this kind in process of construction, which I think will fully answer the purpose intended,

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and which will not cost over ten dollars. When the plants are three or four inches high, they must be thinned down to from five to eight stalks in the hill; the middles should be split with the plow, and much the same course pursued in after cultivation as is followed in raising corn.

VII. Stripping, Topping and Cutting.—The cane should be stripped a week or ten days before cutting. This hastens the ripening, and also increases the richness of the juice. A wooden knife, four or five feet long, may be used for this purpose, or, what I think still better, a strong, three-tine pitchfork. Tools apply only where the cane stands straight. When tangled and fallen, as it frequently is by strong winds and top-heaviness, the hands encased in buckskin gloves are best.

Cane should not be topped until ready to be cut. Nature immediately stops the saccharine forming process, in order to replace the lost heads. Last year I tried the experiment of topping at the time of stripping. I cut two weeks after; the juice yielded only about twelve per cent. of poor sirup, while cane grown beside it, and left untopped until day of cutting, yielded twenty per cent., and of a better quality.

There is a difference of opinion as to how much of the top should be removed, some believing one joint sufficient, others requiring two. I prefer the latter course. The nearer the top the poorer the juice, and that of the top joint has a bitter quality present, rendering it totally unfit to be mingled with the rest.

VIII. Time of Cutting.—This will vary according to circumstances. The cane should be fully ripe, but it should not be allowed to stand long after complete maturity, or it will sour standing in the field. Such was the case, universally, in this region, in 1860. The season was remarkably forward, and most of the cane was ripe by the 15th of September. No frost appeared before the 15th of October. Cane was left standing as long as possible, as it was supposed it would spoil if cut and left in piles long before working up. The over-ripe cane, when cut, was found full of an acid, strongly resembling tartaric acid, which required the free use of neutralizing agents, thereby injuring both taste and color. When it had been cut as it ripened, no such acid was present. I followed the latter course this year, and had not a single stalk of sour cane in my yard.

Specimens of sirup, which I made from cane cut eight weeks before being worked up, are before the Society. The sample was made the 6th day of December. Indeed, I see no reason why the manufacturing season cannot be prolonged until Christmas, if the cane can be kept from freezing. This can be very easily effected by covering the cane deep enough with begasse or straw, particularly where the works are well sheltered from the weather.

In all instances cane must be cut before any *heavy* frost; if possible, before any frost at all, and this can always be effected by

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planting in proper season. The bitter, smoky taste of which some complain, and which made one of our most distinguished horticulturists express the conviction that the plant was degenerating, arises wholly from frost-bite. I have never met with it in any case, where the cane was cut in season.

Storing Cane.—There are two methods of storing the cane when cut, viz: *First*—By cutting without topping, and shocking in the field, which method, when frost threatens and work is pressing, will often prove best. *Second*—By cutting and topping in the field, and then shocking in the mill yard, if the cane is to be worked soon, if not, by cording on the ground and covering with begasse or straw, as above mentioned. Topping can be performed either before or after the cutting.

Trusting that these directions will bring the cane safe to the mill, we will now proceed to grind it—if we can. There's the rub! It does seem strange that iron cannot so be put together as to successfully withstand the required strain. But within a circle of twenty miles in diameter, (further my cognizance does not extend, but I *hear* of trouble enough,) fully one-half the mills have been more or less out of order. Of these, part are home-made, part imported. To be sure, the makers warrant them; but that isn't the thing—*we don't want to stop*. Every day is precious during the working season, and the man who builds a mill that won't break, can make his fortune down our way, if he can only get us to believe him. Better far to make them twice as stout as need be, than the least particle too slender.

I believe that in most cases, when the mill is driven by horse-power, the rollers had better stand upright, as such position avoids the necessity of any gearing, thus promoting simplicity and increasing the surety against accidents. For a one-horse mill, the shafts of the roller should measure two and a half inches in diameter, and that of the driving shaft three inches, and this proportion should be observed in enlarging the size of the mill. They should be well keyed into the rollers, both at top and bottom, so as to avoid any possibility of loosening. The boxing should be made stronger and heavier than any I have yet seen. Every part, where any friction occurs, should be plentifully supplied with oil. Some mills are so constructed that the oil ducts soon become clogged up and rendered useless. With these few hints kept in mind, I know no reason why our manufacturers cannot avoid the faults above mentioned, and produce for us a perfect mill. I should, perhaps, have mentioned that three rollers have proven better than any greater or less number. When set up and ready to work, the space between the first two should not exceed the sixteenth part of an inch, and between the last two the thickness of a knife-blade. This distance takes out the juice clean enough. A piece of sieving should be placed at the end of the spout so as to strain the juice as it falls into the barrel beneath. This precaution prevents any stoppage

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of the faucet of the reservoir at the evaporator. It is unnecessary to give any directions about setting the mill, as the makers give all needed ones.

Evaporators.—Much ingenuity has been expended in the construction of boilers for evaporating the juice after expression. So far as my experience goes, the more rapid the evaporation, the better; and nothing that I have met with fulfills this indication so well as the pan invented by Mr. Cook. It has become so common that description is needless. Its advantages are several:

First—The juice is in constant motion, thus avoiding any danger of scorching. I see that this danger has led many to reject the pan. The trouble arises wholly from mismanagement.

Second—It requires no clarifying agents. Intense heat is found to excel all others.

Third—With no other pan of the same size that I have ever seen can so much sirup be made in a given time, and the faster you boil, the better the result.

The directions which come with the evaporator, render any from me needless. But I would merely say that a little personal instruction from an experienced hand, will be found of great advantage to the tyro.

I do not *finish* in the evaporator. I boil down three-fourths, or thereabouts, and finish in an ordinary oblong pan, projecting on each side considerably over the furnace. I can boil one-fourth more in a day, and it requires far less attention. I take care to keep the fire as hot as possible under the finishing pan, as well as under the evaporator, and when the boiling is finished, which is known by its bubbling like mush, and emitting little jets of steam, I immediately remove it from the fire, which is done by means of handles attached to the pan. I think all who try the extra pan, in connection with the evaporator, will be pleased with the result.

The size of the evaporators and pans will, of course, correspond with the size of the mill. The two pans combined will make from fifty to two hundred and fifty gallons per day. I know of one which averages the latter quantity. I should have remarked before that the sirup should be strained as it runs from the evaporator, and also as it is poured from the finishing pan.

It is very essential to the manufacture of good sirup, that the whole apparatus be excluded from the weather. Wind, by blowing down the bubbles, not only retards evaporation, but prevents perfect clarification. No more wind should be allowed to enter than is requisite for the comfort of the attendants. To insure a good draft to the furnace, it is necessary to have a good length of pipe—not less than twelve feet, if possible—less will do, but more is better.

I hope no one will accuse me of any endeavor to "puff" the aforesaid machine to the injury of others, perhaps equally meritorious. I am simply giving the results of my own experience. I

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have no interest, whatever, in Cook's or any other evaporator, but I do think that Mr. Cook deserves the thanks of the country for the vast improvement he has effected in the manufacture of sirup and sugar, over the *old* way, at least. Should others succeed in carrying on the improvement still further, I should most heartily rejoice.

Believing that pans and kettles are behind the times, I shall say but little about them. As some, however, may not be able to prepare themselves at once with the higher priced evaporators, a few directions to them may not be amiss. A pan made of galvanized sheet-iron for bottom, and plank for sides, three feet by seven, capable of making 30 gallons per day, need not cost over five dollars. The sides should be ten inches deep, and the furnace should be so constructed as to allow the sides of the pan to project some distance over it. Fill nearly full with sap, and just before it commences boiling add a pint of lime-water (which is water completely saturated with lime.) Keep up a faithful skimming; when boiled two-thirds away, remove from the fire; strain and finish off in a smaller pan or kettle; keep up, in both pans, as hot a fire as you can without causing the sap to run over. I do not think that in using either pan or evaporator, perfect cleanliness is any disadvantage, although, judging from what I have seen, others differ from that opinion.

Manufacture of Sugar.—We now enter into an interesting but more difficult department. When Sorghum was first introduced into the country the growers thereof indulged in the most glowing anticipations. Not only were we to "waller our bread on both sides," as a sturdy farmer observed in my hearing, but every family would put away their barrel of sugar annually, as regularly as they laid by their barrel of pork. But these bright visions concerning the last have not been, as yet, wholly realized. While it requires but little trouble to make a good article of sirup, the crystals require considerable coaxing to induce them to emerge from their saccharine abode. Patience and skill, however, are rapidly bringing about the most satisfactory results.

Several have succeeded in making sugar on quite an extensive scale, and many others have made smaller quantities. Now, these results prove that sugar is really present in the cane at cer-

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II. Impure Seed.—The seed sown should be pure Sorghum or Imphee, *not broom corn.*

III. Cane cut when not in condition.—There is a certain period, lasting but a few days, when cane appears to be in greatest perfection for producing granules. This period lasts from the time the seed is fully in the "dough" until it is thoroughly ripe. If allowed to stand longer, a chemical change commences, which destroys the crystalizing power.

IV. Leaving the Cane to lie too long after cutting before it is worked up.—It should be worked up as soon as possible. A very few days delay is sufficient to bring on the same change that occurs when left standing too long.

V. The Juice allowed to stand too long.—The juice should be boiled down as soon as expressed. In warm weather one hour is sometimes sufficient to effect a change fatal to granulation.

VI. Using too much of the Stalk.—Not more than half the stalk should be used. The lower joint and as much as three of the upper should be rejected.

These mistakes having been rectified, let us examine the remaining steps—with, I am assured, much brighter prospects ahead.

The sirup should be boiled down with the most intense heat practicable, and this is why I like Cook's Evaporator so well. The furious ebullition constantly going on seems to separate all the gelatinous and albuminous compounds from the pure and saccharine matter, leaving the latter in a more favorable state for granulation. The proper thickness can be determined in two ways: either by the thermometer or by the steam which rises. The latter should escape in little jets, bursting open the bubbles, which much resemble those arising from well cooked mush. The sirup should then be immediately poured into large, shallow pans or *coolers* and briskly stirred until cool enough not to scorch. If it does not commence graining in two or three days, the best plan, I am convinced, is that adopted by Mr. Miller, which is to prepare a room in which a temparature of 80° to 90° can be constantly maintained. Pour the sirup into barrels having the bottom head (the top head being removed) perforated with several one inch auger holes. These holes should be filled with plugs capable of being drawn out at pleasure. In the course of time the granules settle to the bottom, when the superincumbent sirup may be poured off, the plugs withdrawn and the sugar drained. The sirup, when well made, will frequently grain without any steps having been taken with a view to granulation. The sirup which I made in 1860, nearly all grained during the winter and spring, which, when drained, proved as nice a quality of sugar as you ordinarily find in the stores. This fall has been an unusual one in some respects. The weather remained cool and dry until the cane had partially commenced heading, when it suddenly changed, and a

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long spell of moist, warm, growing weather followed. The cane stopped maturing, commenced growing rapidly, and ripening was delayed until, in some instances, frost overtook and badly injured it. None, however ripe, yielded as rich juice as in the previous year. Crystals have been correspondingly difficult to form; still I have made several small lots, and could I have spared the time, I might have indefinitely increased the amount.

I have not tested any of the experiments mentioned in the papers this last summer and fall. Those who have do not speak encouragingly of the results. I am so well satisfied of the success I have met in pursuing the above mentioned course, that I expect to follow the business somewhat extensively, being now engaged in preparing to work up one hundred acres into sugar and sirup.

PROFITS.—*First*—Can the farmer grow the cane profitably? Let us see. An acre of cane, planted in hills like corn, and well tended, will average one hundred and seventy gallons of sirup. The labor required to tend it will amount to little more than corn —*no* more, in fact, if the hoeing is omitted. The seed will pay for stripping, topping, cutting and hauling to the mill, if near by. Every animal about my farm greedily devours it. I do not place a very high value on the leaves as fodder. My horses will not touch them, and my cows munch them very daintily. Others pronounce them excellent.

The manufacturer receives half the sirup for his share for working up. The farmer has eighty-five gallons of sirup to show for his acre of cane. I think any reasonable man will be contented with such return.

Second—Does it pay the manufacturers? A good one-horse mill costs fifty dollars, and will grind out juice enough to make forty gallons of sirup in ten hours. Cook's Evaporator No. 2, will cost forty-five dollars, (it ought not to cost so much,) and a finishing pan, 3 feet by 4, five dollars more. Other appliances of all kinds, such as furnace for finishing pan, barrel, reservoir, buckets, etc., will cost ten or twelve dollars more, shed twenty-five or thirty dollars, total, one hundred and fifty dollars. This apparatus will require three persons to manage it. I made, this fall, 2,400 gallons of sirup with such, and my mill was useless from breakage ten working days of the time, during which I could easily have made 600 gallons more. We worked, it is true, from twelve to fourteen hours each day, but of course there is no time to be lost in the busy season. A two-horse mill and evaporator, to correspond, should be able to work up nearly double the above amount. The earliest cane, if planted in due season, will usually be ready to work by the 10th or 15th of September, and the season can be prolonged, as I have before stated, until every thing is frozen solid, which does not often occur until towards Christmas, making the average length of the working season three months.

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EDUCATION OF FARMERS' DAUGHTERS.

By Mrs. John R. Woods, Upper Alton, Illinois.

This is a subject which may well fill with the deepest interest the minds of our farming community. The education of our *sons* does not involve *half* so much anxiety. *They* have the "wide, wide world" before them; can choose their own professions, make, in a measure, their own destiny; can fly from one thing to another, as caprice, fancy or convenience may dictate. Heedless of the lynx eyes and gossiping tongue of Madam Rumor, they can plan and execute things which girls cannot, dare not do.

Farmers' sons, should they not choose to follow the plow, and bring hidden treasures from the bosom of Mother Earth, can wander over all creation, from pole to pole, from east to west, and gain knowledge, (not always the *best*, we admit,) which they never could gain on the farm. Though we believe, with Ike Marvel, that "there is no life in the world, which, well husbanded, has not its opportunities for culture; but to say that the working farmer's life is specially favored in this respect is the grossest kind of an untruth."

When our sons leave the paternal roof, though they may still be young in years, our constant and immediate care for their physical wants, and the cultivation of their intellects, ceases. They are thenceforth to buffet the storms and waves of life, "for better or for worse," as best they may, according to their home training, from wise, discreet parents, or otherwise. Sometimes, if their intercourse be much with men of integrity and literary attainments, their minds improve rapidly; their hitherto contracted views of

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useful knowledge—geographical, agricultural, scientific, geological and commercial—which our daughters seldom have. The knowledge *they* gain is through books, by hard and persevering study. That they should understand all these subjects as thoroughly as our sons, is a fact so plainly demonstrated in every-day life, that a ten minutes' review of the subject, by unprejudiced minds, will make it so plain "that he who runs may read."

Let me here venture an assertion, at which the proud man, the demagogue, or the ungrateful son, may toss his head aloft, and curl his lip with scorn; yet it is nevertheless *true*. It is this: that woman is the lever that moves the world—at least this quarter of it in which we dwell. How highly important it is, then, that she should be well educated and judiciously trained. John Bell (the traitor) once said: "All reforms of government must commence with the people, by enlightening them. If you would preserve the Union, enlighten the people." Another says: "The perpetuity of our political institutions depends on the virtue and intelligence of our citizens, and literature, by disseminating knowledge, might be rendered highly available in giving stability and permanency to our system of government."

Had the wives and mothers of the Southern traitors been well versed in the history of the United States, our constitution and laws—had they been imbued with the spirit of true patriotism, and the correct principles of human rights taught in the Gospel of Peace—had these been impressed upon their minds while under their mothers' instructions—think you the present mad rebellion had ever been brought into existence? No; *never*, NEVER.

And who are the first teachers of the men of our land? Who break up the fallow ground, and sow the first seeds? Who lays the foundation upon which the school-master and professor rear the structure? Not the fathers, surely; for *they* very adroitly lift the burden from their own strong shoulders, pleading business of *much greater importance*, and lay it quite patronizingly upon the shoulders of the weaker sex, as though they were better fitted, in some way, (they can hardly tell how,) to bear this mighty responsibility. If this be so, it becomes us, as Christians, as patriots, as philanthropists, to see that our daughters are rightly educated. Not superficially, merely, with a few showy accomplishments appended, but with the moral endowments of their nature appropriately cultivated, as well as their mental and physical. They should be educated to become useful—to be a light and joy in our households, and a crown of rejoicing to the happy men on whom they may bestow their priceless affections.

The question now arises, what *is* the most useful education? *That*, most certainly, which produces the greatest amount of good to the world around us. Webster says: "Knowledge does not comprise all that is contained in the large term *education*." The feelings are to be disciplined; the passions are to be restrained;

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true and worthy motives are to be inspired. A profound religious feeling is to be instilled, and pure morality inculcated, under all circumstances. All this is comprised in education.

For the last quarter of a century, we of the Western country, in one respect, at least, have been retrograding. There has been something radically wrong in the education of the women—something that, after close investigation, can be accounted for only in one way.

Many of the early settlers of these States, when they migrated hither, were in reduced or very moderate circumstances—having a limited amount of book lore, and a still more limited knowledge of the manners and observances of educated and refined society. In the course of a few years, by industry and thrift—often by a sudden rise in property, or a successful speculation—those farmers became rich; then, the daughters must be sent, for a few months, at any rate, to some fashionable boarding school. A little smattering of this study and that was obtained—barely sufficient to admit them into "good society," where, on account of the wealth of their father, or the position he occupied in the public affairs of his county, they were permitted to mingle. Never having heard, perhaps, that "a little learning is a dangerous thing," they often—too often, alas!—became the sport and by-word of those who pretended to court their presence.

These are the mothers of our parvenu ladies—belonging to both city and country. These ladies ape the manners and advocate the sentiments of their superiors; spend their precious time in the most frivolous occupations: their days in the streets, shopping, gossiping, idling; their evenings at places of fashionable amusement, or, worse still, in perusing the miserable, wishy-washy trash gotten up merely for the gains they bring, with no object set forth, and no good morals inculcated. Such works are flooding our whole land with unprecedented rapidity, and bid fair to spread their mischief as wide and deep as the deluge of Noah. Some one may ask "if there is *no remedy* for *this* evil." Yes: let mothers, as soon as they find one of the vile things in the hands of their daughters, throw it into the fire! In this way, some thousands may soon be reduced to their proper element. These works may easily be known from valuable works of fiction, by their low prices, and the flaring daubs of red and yellow on their covers. The very *sight* is sickening to a pure mind.

It is rarely, now, that we see farmers' daughters of the type of thirty or forty years ago. *Then*, it was the delight of one's heart to visit a farm-house, and be welcomed in the most cordial and demonstrative manner, with a good, earnest shake of the hand from the rosy-cheeked, bright-eyed daughters: rosy and bright from healthful exercise; cordial from the warm, fresh gushings of kind hearts; what cared they, if their sleeves were rolled above their elbows, or their dresses pinned up, displaying nice domestic under-

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coats, strong shoes, and *whole* stockings? They came at the sound of the knock—as bells were not much in vogue in the country then—never waiting even to pull off their check aprons. *Now*, we have to sit, and wait, and wait, until the time allotted for our call has nearly expired, before the young ladies (not country girls now) make their appearance from their dressing rooms.

Then, farmers' daughters were never ashamed to be caught at the wash-tub, or seen scrubbing off the porch or kitchen floor. But *now*, (the disease caught from their young city friends,) they do not care to have their visitors know that they *ever saw* a *wash-tub* or *kitchen floor!*

Then, farmers' daughters were not ashamed to be seen taking their milk-pails, and going out among the gentle cows, which they had taught to love them; drawing from their distended udders the sweet, rich beverage, and, returning, strain and place it in milk-house or cellar; then, having done up all their night chores, sit down to their knitting, their patch or needle-work.

A knowledge and performance of these duties are not incompatible with the character and bearing of a true lady. Now, the difference is so sadly the *reverse* that it will not be traced in these lines.

Then, farmers' daughters took a pride—a noble, laudable pride—in displaying to their friends and lady visitors their own domestic work—a great amount of such being done in those days—their piles of beautiful quilts, woolen and cotton counterpanes, finely-knitted woolen, cotton, linen, and even *silk* stockings—the latter made (I will say in what manner, for the sake of those who may wish to try the mode, in these days of fabulous prices,) by picking to pieces old silks and satins, mixing with half cotton, carding on hand-cards, and spinning on the little wheel! There were also domestic laces, very neat, and pretty, too, made on footing, in small frames, and worked in thread lace patterns with linen thread or floss. They also wrought their own black lace veils, worth ten and fifteen dollars each. *Now*, our daughters are not willing to wear anything that does not cost money, and of the highest price, too, because, forsooth, Miss and Miss such-a-one wear imported ones, and would laugh and look with contempt on their home-made ones. Alas! for the degeneracy of the times!

There were also those handsome white tufted quilts, made with cotton spun by their own hands, designed by their own ingenuity, and executed with a desire to make all such furnishings for their father's house. There, too, were the white quilted ones, which rivaled Marseilles; and the beautiful nettings and fringes for windows, toilet tables and bed-valance; the piles of flannels and blankets, and gay linseys and kerseys, that, for certain purposes, were as good, and nearly as pretty, as the present imported Balmorals. Proud must the parents have been of *such* daughters,

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and thrice blessed the men, be they farmers or city bred, who obtained them as partners for life!

These were the wives and mothers of thirty-five and forty years ago. Their *mantles* descended on their daughters, partially worn; still, they were not thrown entirely aside; but the *grand-daughters* felt that they were old and faded, and hid them away—not that they really despised the doings and sayings of the dear old grandmothers, but *society* had changed, and would not admit of those antiquated works and notions; they are *too common*, *too old-fashioned*, and look as if you could not afford anything better. So, much to the chagrin, sorrow and disappointment of our farmer-fathers, they must let our girls have their own way, if they wish them to keep pace with the times, or be tolerated in society. We are truly a *fast*, *progressive people;* but sometimes our progress is on the backward track, and our fastness defeats the very purpose it was intended to advance.

It is not to be understood that there are now no farmers' wives and daughters of the olden stamp to be found. For the sake of the farming interests of our own great State, it is sincerely hoped there are *thousands* of strong-minded, brave, heroic women, who are ever ready to aid their husbands in furthering whatever is for the welfare and happiness of their families. It may be objected to the old mode of educating daughters to work, that it was to the exclusion of the cultivation of their intellects.

I beg permission to say that this, as a general rule, was not the case. The daughters of intelligent farmers, in easy circumstances, were taught the common branches of a good English education; they could generally spell and read *well*, which is more than can be said of scores of young ladies now, who have passed through piles of books, and received their diploma at some seminary. If they could not demonstrate a problem in Euclid, nor rattle through a lesson in conic sections, they knew enough of plain, simple arithmetic to add up and multiply the number of pounds of butter, cheese and maple sugar it would require to pay for a new silk dress and Leghorn hat. If they knew nothing of Fasquelle or Virgil, they knew something of old Lindley Murray; and what they knew, they knew thoroughly.

They were not familiar, perhaps, with Paley's Evidences of Christianity; yet many of them had the precious evidences in their hearts, and practiced them in their daily walk through life. Though many never so much as heard of Wayland's Political Economy, yet they perfectly understood and practiced *domestic*

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They were women of good, sound sense, of high principles, pure patriotism, and industrious habits.

They may, indeed, have been deficient in fashionable etiquette and the conventionalities of the Parisian court; but they were possessors of a far more sterling virtue, in the native politeness of frank and honest hearts; the politeness and unselfishness which the Word of God teaches, that feels for the comfort and well-being of all His creatures.

Ask those farmers who are beginning to descend into the vale of life, if, in their intercourse with the book-educated and accomplished girls of the present day, they find many of the bright, cheerful, dutiful daughters of "lang syne"—such as are suitable to fill the niches that are, or soon will be, made vacant by the removal of the originals in the above picture. They will doubtless think, and think, and sigh; but no answer, only a heart-whisper, which says, "few and far between."

Oh, it is sad to think that a change for the worse, in some respects, should have come upon us; sad to think that *we* and our *daughters* should be ashamed to be seen doing, or heard advocating, that in which our brave, noble fore-mothers gloried!

The parvenu *ladies* of our day rather glory in their ignorance of anything pertaining to such a rustic business as farming. When speaking, once, in the presence of a young city lady, on the size and beauty of wheat and rye straw, with which I was working, she exclaimed: "Why! is that the way straw is made? I never knew, before, where it came from, nor how it grew, nor that it was of any other use only to fill beds with." Another, when visiting us, as she accompanied me to the milking place, asked which side of the cow I stood on, to milk. Another, when I remarked to her, on viewing some fish geraniums in the window, how much their scent was like that emitted from the scales of a fresh fish, exclaimed in astonishment: "Is it? Why, I never knew, before, *why* they were so named. *I never smelled a fresh fish!*" At the same time, I knew that she had come from the land of fish, on the seashore, and that her mother had spent much of *her* time in the kitchen. Some one must have cleaned fish at some time; at any rate, she ought to have remembered how *codfish* smelled!

I blush when I think that our great American Republic, with all its enlightening, its privileges, and present advantages of education, should produce such shallow-minded women. They (*some* of them, at least,) will be the mothers of our future statesmen and high executive officers. What kind of men are we to expect from the training of such mothers? and what daughters, too? If like mother, like daughter, what will the *next* generation be good for?

From a careful review of the subjects mentioned, it is apparent that there is *something* wrong in the present system of female education; and it behooves the earnest, practical mothers of our country to set about a reform.

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A farmer's daughter, before she leaves her father's house for a boarding school, should be conversant with everything relating to the farm, so that she can give intelligent answers to questions on the subject. This knowledge will assist greatly in her studies, and form many a fruitful theme for compositions. She should know the number of acres the farm contains; the number suitable for tillage; the number unfit; what proportion is in grass; what in orchard; the number of cattle, sheep, swine, etc.; the number of bee-hives, and annual amount of honey. She should know the quality and quantity of the timber. The different kinds of forest trees should be to country girls an interesting study; their season of blooming, and of fruit maturing, the shape of their leaves, their bark, their uses, should all be known. The annual production of orchard, of garden, (in which she should be a daily visitor during the spring months, with her trowel and little hoe,) the meadows, the corn and wheat-fields, should not escape her attention.

The produce of the dairy should be an interesting subject to her. If she has assisted to make those magnificent cheeses, and that sweet golden butter, she will know the amount of avails therefrom. The poultry yard, with its myriads of interesting occupants, should claim her special attention; from the contented and good-humored hens she can learn rare lessons of philosophy, by seeing how they "take the world as they find it."

It would in no way diminish her lady-like appearance, or mar her beauty, to scamper through the barn and mount the hay-mow in search of eggs; on the contrary, it would enhance both, by giving flexibility to her limbs, and an added bloom to her cheeks. To call the cows, or sing some lively air to the utmost stretch of voice, while racing round the yards and orchards, would strengthen the lungs and develop the chest, and better fit them to bear the confinement of the school-room. But here come in the forms of fashionable life, brought from the sickly sentimentalists of towns and cities: *they* say it is not *genteel* for girls to speak *louder* nor *plainer* than a *murmuring whisper*, nor to laugh so as to be heard, nor race round in joyous glee; it is vulgar! it is hoydenish!

Ah me! Of what true, exquisite pleasure we often deprive ourselves, and to what trouble and inconvenience subject ourselves, merely to please that imperious old tyrant, Fashion!

But to resume what we were saying: What reason is there *why* our daughters should not be acquainted with all business of the farm, as well as our sons? Surely they have a like interest in

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their expenditures exceed their father's income. Here they might study Wayland with advantage.

It would be a good plan for parents, during the long winter evenings, to give their children short weekly lectures, on some such subjects as agriculture, economy of time and money, improvement of time in early youth, on causes and effects, etc., etc. But, above all, let the *mothers* teach their daughters, both by precept and example, an exalted independence—to fear not to do *right*, let the world smile or frown. Teach them self-reliance, and patience, and perseverance, in everything they undertake; teach them frankness and sincerity—two such admirable traits that none can meet them but to love them; teach them prompt obedience, and to love truth and honesty; teach them to love their country; sow deep the seeds of *patriotism* and *loyalty;* teach them industry and neatness, taking the bee for a pattern; teach them love to God and man; then open the book of nature, God's great album, and teach them natural history therefrom. Teach them to know themselves—not only their tempers and temperaments, and self-government, but instruct them thoroughly in the principles of physiology, that they may know how "fearfully and wonderfully they are made"—that they may know how to secure and preserve their health—one of the greatest earthly blessings bestowed on man. None so well as a sensible mother can make plain to the inexperienced child the worth of the knowledge of physiology to her, through all the seasons of her life.

Cultivate a *love* for knowledge, and then present such inducements before them as will cause them to *thirst* for it, "as the hart pants for the water brook."

Then, above all, teach them to cultivate a cheerful, hopeful, happy spirit. It is a priceless blessing, second only to *good health*, and is really the promoter of it. It is a mine of wealth to its possessor. It, like mercy, "is twice blessed: it blesses him who gives and him who takes." It makes a continual sunshine around it—warming into life the dull and cold, cheering the desponding soul, and giving life and beauty to everything, and all on which its lovely light doth fall. It wards off disease; gives brightness to the eye, and elasticity to the step; the frightful dyspepsia dares not enter a system which contains this gem of a cheerful spirit.

With this panoply of a mother's love and careful training thrown around them, our daughters can, with impunity, be sent from home for a few years, to finish, in a more masterly and systematic manner, what has been begun at their mother's knee. If they have adhered to these home instructions, no fear need we have that their time will be idly spent; no fear that they will be troubled with "dear me's!" nor waste their days in useless regrets and complainings. On the contrary, we have everything to hope. We have a *right* to expect that they will return to us skilled in all the

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learning that makes a woman useful, and endowed with every grace and accomplishment that renders her loving and beloved.

Mothers! what a glorious reward for your faithful endeavors to imbue their minds with the useful and the good.

Women educated in this way could never rear a *traitor son*. It would be an inconsistency—an utter impossibility.

Look to it well, farmer-parents, that you plant good seed, and cultivate it with the most diligent care. "In the morning sow thy seed, and at eve withhold not thy hand, as thou knowest not which may prosper, this or that."

With these immortal souls, which He has given us to rear, God has said, "take these children and nurse them for me, and I will give thee thy wages." Take Him at His word. Our wages will be *great* or *small*, just as we have earned them. Let us give our daughters such an education as befits the "bone and sinew" of our country to give those who are to form the minds and mould the characters of our nation's heroes and philanthropists—such as will make them strong in purpose, mighty to act: that, if great emergencies should come, they will be able to meet them with that promptness, decision and fortitude—that dignity, self-possession and independence—which should characterize every true American woman, especially every native Illinoisan.

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THE EDUCATION OF FARMERS' DAUGHTERS.

By Miss Mary E. Murtfeldt, Rockford, Illinois.

The education of woman is no new theme for tongue or pen. From the wisest philosopher down to the merest witling, all have given us, at one time or another, some theory, system, plan or suggestion, until the public is well nigh surfeited, and yet the goal of perfection is still in the distance.

One peculiarity in the treatment of this subject is, that no two of the educational *savans* can agree. Their arguments usually present a right angle to each other, or if they start in the same strain, one or the other is sure to fly off at a tangent before the first page is completed. For instance, one advocates the equality of the sexes, and wants all the college doors thrown open to women, thinks they should be invited to all the learned professions, and graciously bestows upon us any amount of superfluous compliments in regard to feminine intellect. Another, cumbered with the clogs of conservatism, protests against such new-fashioned freedom, and gives his vote in favor of a more restricted system, and, as a climax, defines for us "woman's sphere," with a flourish of rhetoric that silences all demurrers. And between these two we have writers and lecturers of all intermediate shades of opinion, each possibly elucidating *some* truth, yet making it a difficult task to select the grains of wheat from amid such an abundance of chaff.

The theoretical education of the farmer's daughter does not differ from that of the banker's or merchant's daughter. She studies the same text-books and attends the same schools, consequently the suggestions that relate to her case must necessarily embody thoughts for general application.

There is now nothing in science or art that is withheld from the investigation of woman; the field is wide, and she may gather the gems of wisdom wherever she will. This is as it should be, for the mind should not be fettered by arbitrary rules in any case. Still, it is the opinion of the writer, that turning this *liberty* into *law* may be as conducive of harm as the practice of a more limited plan of education would be. The young girl who is subjected to the hot-bed culture of our popular seminaries, and pursues, without dis-

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crimination, *all* the studies of the prescribed course, and graduates at sixteen or seventeen, does herself an amount of injury which no after culture will entirely counteract. At all events, her overstrained mind, too immature to assimilate what she was required to commit to memory, suffers a reaction that will, in almost every case, cause her to turn with disgust from anything like severe mental effort.

I would not be understood as finding fault with our institutions of learning, but only with the very common abuse of the privileges they afford, and with the idea that girls must certainly "finish their education" by the time they are eighteen. And yet, that education must comprise Latin and Greek, law and theology, mathematics and metaphysics, with frequently a smattering of the accomplishments and modern languages, and all this at a total disregard of the learner's preferences or natural endowments, because it is fashionable for women to be "*thoroughly* educated."

The writer has not the slightest objection to girls studying the same text-books in the same schools with their brothers; doubtless there are many advantages connected with such a system for both sexes; still, I must hold to the opinion that they (the girls) should give preeminence to those things which will best qualify them to adorn and honor the position which they are expected to fill in the family and social circle. This position being radically different from that of men, is it not expedient, in order that they may supply masculine deficiences, that *their* preparatory training for the duties of mature life be conducted upon another plan?

There is nothing that renders a woman more irresistible and valuable to society than a thorough knowledge of those available accomplishments which most men have a taste for, and which but comparatively few find time, in the midst of their graver duties, to cultivate. If, therefore, it is impossible, for lack of time or other reasons, for a girl to combine the two, and we must choose, give us music instead of the higher mathematics, and painting and embroidery, and the modern languages, instead of the abtruse sciences. If this be heresy to the ideas of the age, it is a heresy justified by the practical, if not theoretical, preferences of society. Of course, there might be many circumstances that would induce us to re-

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structions on the various sewing machines now in use, together with an explanation of the mechanical principles involved in their construction and management.

Farmers' daughters, as well as other girls, require the stimulus of other minds in pursuing their studies. Solitary study, except in rare instances, is not apt to be very systematic, therefore it is proper for them to attend such schools as afford them the best facilities for moral and mental improvement.

If necessary to send her from home—and absence from home involves some valuable experience in itself—she should not leave it until she has arrived at the age of sixteen or seventeen. She will then be old enough to judge for herself what particular department of knowledge she has a natural bias for, or which some plan for the future requires that she should become familiar with. It is not necessary to bespeak for any girl, whether of country or city, a thorough acquaintance with all those branches of education usually taught in our common schools, and which form the only sure foundation for a plain or ornamental superstructure. Many of the divisions of natural history offer peculiar attractions to the observing country girl, and without some knowledge of them, she loses much of the rarest pleasure a country life affords. Among these we might enumerate botany, entomology, zoology, etc.

These remarks have, thus far, been confined to intellectual culture alone; but there is another phase to the subject no less important. The *practical* education of a farmer's daughter differs, in many respects, from that of other girls. Her circumstances and surroundings are unlike those of the city girl, and necessarily include a peculiar training.

Perhaps the first thing that should be taught the farmer's daughter is a thorough love and respect for her father's avocation. The young girl, who, when away at school or among city acquaintances, blushes to own that her father is a "farmer," shows either a trait of character of which she should be ashamed, or else that the teaching she has received has been culpably erroneous. The great mistake so often made is in considering true delicacy and refinement incompatible with the ordinary cares of the farm and household. We are sorry to confess it, but it is true, there is a growing tendency on the part of country women to ignore those duties pertaining to their station. The progress of invention and the accessibility of knowledge, have done away with all those indefiable distinctions formerly existing between the rural classes and the metropolitans, and now, in many cases, the highest ambition of a country girl is to keep the parallel perfect between *her* life and occupations and those of her city class-mate, scorning the wider range which is her prerogative.

It is perfectly proper for the farmer's wife or daughter to employ as many servants as she wishes or can afford, but that sort of pride, which leads them to consider their ignorance of the various branches

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of domestic economy with satisfaction, merits our pity if not contempt. Besides this, it is a perversion of natural instincts, for every true woman has, or ought to have, a genuine pleasure in the care and oversight of a household, and should delight to understand all its minutiæ.

It is an excellent thing for the farmer's daughter to have a thorough scientific education—and if she understands music and painting, it is well, too—but should she therefore look with scorn upon the profitable and by no means ignoble art of making butter or moulding bread?

Every young woman, without regard to present or prospective wealth or position, should therefore be well taught in all that pertains to domestic economy. She should consider it in the light of an accomplishment if she knows how to sweep and dust, and starch and iron, and she may justly be proud if she can bring upon the table a well-cooked dinner, prepared by her own hands. Housekeeping is woman's special province, and it is always an indication of mental weakness to hear her boast that she never made a loaf of bread or cake, or washed a dish, or laid a table-cloth. To a country girl such ignorance would be almost a disgrace.

The daughter of a farmer, who has an inventive mind and skillful hands, has it almost entirely in her power to render her home beautiful and attractive. She is not dependent upon either the upholsterer or the artist for its greatest adornments. Her tasteful fingers can twine the drooping sprays of roses or honeysuckle, or clasp the tendrils of the grape-vine over the trellis, forming thus a screen more graceful than the richest damask; while her bouquets upon table and mantle, filling the room with delicate odors, impart an air of grace and refinement which the choicest gem of art might fail to do.

The country girl's employment should not be all in-doors; there are many of the lighter duties of the farm-yard and garden which are suited to her strength, and which are more potent than any gymnasium in developing a perfect physical conformation. Many of the tasks, usually considered exclusively masculine, might be delegated to the hands of women, and would be found by them much more conducive to health than the majority of the feminine toils they impose upon themselves. The exigencies of war have shown us many examples of what woman *can* do when actuated by necessity or a noble ambition. I do not advocate the hard labors of the farm as suitable for woman, where they can be avoided. It presents an unpleasant incongruity to all our ideas of fitness and propriety to see her working as a field hand, still there are many ways in which she may render herself useful in the poultry-yard, in the garden, and in the nursery and vinery, and by which she can add to the attractiveness of her home, and to her own independence at the same time, without compromising either her dignity or her delicacy.

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It would be in vain to attempt to enumerate the many ways in which the farmer's daughter should qualify herself for usefulness. Her's should be a home mission of love and duty, and she should consider, with earnest desires after truth, how potent her influence may be upon the happiness and rectitude of her father and brothers. It should be hers to dispel, by whatever blandishments in her power the cloud of care that rests upon her father's brow, when, wearied, and oftentimes worried, he returns from his labor. Her willing fingers should be always ready with those small, but by no means unimportant, services that are ever so grateful to the exhausted frame and over-strained brain. She should press into her service sunshine and bloom, and everything graceful and sweet that appeals to the esthetic nature of man, to efface the impressions which toil and axiety make upon his mind. She can thus, in many inexplicable ways, render her life a blessing to her father and brothers. Hers alone is the fairy touch than can soften down the asperities of their character, and cultivate each germ of finer feeling which gives such a charm to a manly intellect, and yet is oftener crushed out than fostered.

It would be impossible, within the limits of this article, to lay out a complete system of female education, even were the writer competent to the task—which she does not assume to be—nor would it be possible to accommodate such a system to the case of each individual, but the idea was to indicate a general outline from which each could draw such suggestions as suited her case. If, however, any thought offered in these pages will aid in giving any farmer's daughter a correct idea in regard to her position and the duties pertaining to it, the best hope of the writer will be realized.

There *is* a standard of perfect womanhood which glows in the poet's dream and lives in the philosopher's speculations, and if that standard is ever attained to, why should it not be by the country girl, whose best life lessons are learned in the companionship of Nature, and listening to her sweet revelations of Divine wisdom.

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THE IN-DOOR ADORNMENT OF HOME.

By Miss Mary E. Murtfeldt, Rockford, Illinois.

A dissertation on the subject of "Home" would be no anomaly in the field of literature. Poets and romancers have, again and again, brought their choicest thought-gems to decorate the palaces and cottages of the ideal world, and there are few minds, even among those less richly endowed, that do not cherish some sweet abstraction upon the almost sacred theme.

Within a few years, many articles of a more practical character have been given to the world, embodying directions for rendering our homes attractive, both in their external surroundings and internal conveniences, and public taste manifests a proportionate improvement from their stimulus and that of the example of persons of taste and enterprise.

The subject of the "in-door adornment of home," which the Executive Committee of the Illinois State Agricultural Society have been pleased to select for an essay, is one which cannot be so lightly disposed of as one might imagine. To a thoughtful mind, viewing it in a proper light, it presents important features which may not easily be set aside. We all know that home is the place where our earliest and strongest impressions are received, hence the necessity of having its surroundings and accessories of such a character as to inculcate correct ideas pertaining to the thousand and one little matters of judgment and good taste, which all are called to decide upon during life. Neither is it in the homes of wealth alone, that those important lessons may be taught. The smallest cottage, with its simple furniture and rag carpet, may be enshrined in our hearts as the embodiment of harmony and beauty, and where the unpretending decorations are disposed by tasteful hands, it might often exhibit more of both than many a home of opulent vulgarity.

The person upon whom devolves the task of arranging the minutiæ of the various articles which constitute the necessities of a household, needs to remember one rule in particular, which is this: Furniture should accord in character, as well as size, with the dwelling in which it is to be placed.

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Small, plain buildings, around which nature may be invited to lavish her choicest treasures for out-door embellishment, need, internally, but little aid from art, and should be furnished in the freshest and simplest style. There would be something incongruous in marbles, heavy gildings and silken hangings in such a home, which would be apparent to the most casual observer. On the other hand, lofty, marble-fronted houses, would have a mean appearance set out with such articles as would be appropriate, and even elegant, in a cottage.

It is, of course, evident that the size of rooms must depend upon that of the house; a passion for a great number of them, however, often induces builders to divide, and sub-divide, a dwelling of fair external proportions, until no single room justifies the expectation we might have of them.

Another thing. Attention should be paid to the hight of the rooms. No house should be built for a permanent residence where the ceilings are less than nine feet high, and for hygienic reasons, as well as for appearance, we should much prefer them ten or ten and a half, but not higher, for too lofty ceilings are opposed to a homelike aspect.

The parlors should, if possible, be large rooms. Many people, we know, prefer them small; they are more cheaply furnished, and more cosy, they say. This is wrong; for no person can move with ease and grace in a room twelve by fourteen, and it is extremely unpleasant for one to be obliged to arouse and attract the attention of every person present in making a slight change of position.

The furniture of any room may be so arranged as to secure cosy corners and semi-isolated nooks, which are the true secrets of a cheerful appearance.

For a study or ladies' boudoir, a small room is most suitable, as being less lonely, and possessing an air of seclusion, inviting to quietude and comfort.

Bed chambers should not be small. In spite of all that has been said and written by medical *savans*, bad habits are still persisted in, and the prevailing practice is that any closet large enough to admit a bed, is well enough for a dormitory. If such rooms could be well ventilated it would make but little difference; there are, however, but few people who can endure a draught of air from a window directly above or beside them, when, if there were space for the bed to stand to one side, they would experience no inconvenience from the same.

One very good general rule is to have all the rooms, most occupied by the family, on the sunniest and most cheerful side of the house. A room without sunshine is, at best, but half furnished.

So much for preliminaries. The independent features of household decorations we will consider by themselves.

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PAPER HANGINGS AND PAINTING.

Many persons, in their selection of wall paper, neglect to observe that some patterns, which are beautiful in themselves, depreciate very much, and become absolutely wearisome when viewed in connection with their numerous duplicates upon the walls of a room, and *vice versa*, some papers which, independently, have no special beauty, may look elegantly when hung. Large flowing patterns are seldom in good taste, they reduce the apparent hight and size of a room, and when bright colors predominate, form the worst possible background for pictures. Any person of refined taste experiences a shock to his sensibilities on coming into a room where the walls are covered with those distorted landscapes that we sometimes see in wall papers, where overtopping mountains threaten instant destruction to diminutive cities, built in defiance of every architectural rule, and whose inhabitants were evidently formed after no model "in heaven above or in the earth beneath."

Small striped patterns, or where the figures are arranged in perpendicular lines, have the effect of increasing the seeming hight of a room, and should always be chosen where the ceilings are low.

Papers arranged to imitate cornices, columns, pilasters, etc., though they may be ever so beautifully executed, are not to be recommended except for very extensive rooms, and where there is a seeming propriety in such support as they represent.

For a small parlor, a delicate cream-colored ground, with a gold leaf, is very pretty; or a white ground, with tiny clusters of flowers in pale colors. To our eye, however, the most beautiful paper of all, and one forming the most desirable and harmonious background for other objects in a room, is a satin paper of one color, pale buff or pink, heavily varnished, and finished with a rich, deep border of crimson and gold, or green and gold. It would seem to be very plain, too plain, perhaps, for any but the most unpretending parlors, but one can scarcely imagine the air of elegance it imparts to a room.

In papering dining rooms, one may use somewhat brighter and darker colors, and some care should be taken to select those which will appear well by lamp-light.

Bed rooms should be hung with such patterns and colors as furnish repose to the eye, and do not admit of distortion by any freak of vision. Light, graceful figures, in vines and flowers, are suitable, and are agreeable objects upon which to rest the eye. Dark papers should always be avoided, they give a room a gloomy look; so do papered ceilings, also. Kitchen walls should never be papered; they have a much more cleanly look with a fresh coat of whitewish every few months.

As regards the painting of the wood work, there is but little room for variety, and as little need of remark. For parlors and bed rooms, white is the color generally used, and is most appropriate—the grainings and imitations of darker woods, though beautiful in

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themselves, have a depreciating effect upon the furniture, and should only be used for those rooms which are not expected to contain a great deal of the latter.

CARPETS, CURTAINS, ETC.

Carpets and curtains, for winter use, should harmonize in color and shading, and, if possible, the same color should predominate in both. For summer curtains, white is the most fashionable and the prettiest color, and though they (the curtains) may be of simple muslin only, they always have a fresh look which is grateful to the eye.

In carpets, bright, well defined colors and cheerful contrasts give the best impression; and where the furniture is light and characterized by any shade of yellow, blue should be the prevailing color in carpet and curtains, but crimson and green and rich brown accord best with rosewood or mahogany. Moderately large patterns and a due proportion of white, or some light hue, should be chosen for a parlor; but for bed rooms and rooms much used, dark, small figures are most durable.

In regard to curtains, one would think, on entering some fashionable residences, that windows were merely put in for the purpose of displaying costly draperies; for surely, the most penetrative sunbeam could scarce find its way through blinds, shades and voluminous folds of heavy curtains. In our opinion—humbly advanced—shades are unnecessary where there are blinds to the windows; they are, at best, but stiff, unmanageable things, and always detract from the graceful outlines of a tastefully looped curtain. If there are no blinds, however, they are a necessity, as something must intervene between the curtains and the sun, to prevent the latter from fading the colors and destroying the fabric.

FURNITURE, PICTURES AND ORNAMENTS.

Modern mechanical and artistic skill has left very little to be desired either in articles of utility or ornament. Our commonest conveniences even have borrowed the semblance of beauty, and independent of their associations, would grace any apartment.

One great difficulty in furnishing drawing rooms and parlors is the loss one feels in deciding when to cease adding to their contents—unless the limits are fixed by the purse. Comfort demands a few articles, fashion more, and a love for the beautiful and a desire for novelty, extend the list indefinitely; thus the apartments in a house furnished according to the "*ton*," are often so crowded with tete-a-tetes, ottomans, cushions, arm-chairs, and the like, that a person, in passing across the room, would be obliged to describe circles and curves equal to a passage of the labyrinth of old. As to the exact number and description of the different articles of furniture necessary, *that* would, of course, be beyond the limits of this essay to designate; the most important thing being to so ar-

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range whatever one has, as to give an appearance of ease and graceful negligence to the general aspect of the room, and to guard against anything stiff or forbidding.

The subject of pictures is well worth careful consideration. It should always be borne in mind that one *good* picture will give more pleasure and improvement than a dozen of indifferently executed ones. Another thing: To do pictures justice they must be hung in a proper light, and in harmonious company; they will not bear crowding. We sometimes see the walls of a room so covered with landscapes, portraits and fancy pieces, as to remind one of a picture gallery, and with exactly the same effect, viz: detraction from all. One chaste oil painting and two or three fine engravings, will furnish a small parlor very gracefully. Where there are several paintings required for one room, the person upon whom devolves the selection should be careful that they correspond in tone, for high toned pictures, though they may be inferior in many artistic points, will bear off the palm, at a casual glance, from those whose value may be ten times greater, but who cannot rival the others in mere brilliancy of coloring.

A lady writer has said that, "if she were a millionaire, each room in her house should be the shrine of one, and *only* one, pictured divinity;" and the idea is a beautiful and correct one.

The last thing to be considered is ornament, and has reference to those small trifles with which we fill up empty space on tables, mantles, etc. There is great need here to guard against superfluity; a profusion of trifles sometimes becomes a source of more annoyance than pleasure. A card basket, a few books in elegant bindings, and a vase of flowers is sufficient decoration for a table. A mantel-piece furnishes an excellent place for display of fancy articles, and there they are very appropriate.

Flowers are always admired; but growing plants, unless protected by a Wardian case, and very carefully tended, are apt to make too much litter to be allowable in any very nice rooms, though it seems a pity to exclude what would otherwise give so much pleasure. Hyacinths may be grown in glasses, in water, without being liable to the objection above referred to. There is but little need to enumerate other things which beautify our homes, good taste will suggest them in their place.

There are still many topics of interest connected with this theme which must necessarily be left untouched. Still, if the few hints here given, which have been drawn from personal observation and various good authority, aid any person in forming a more correct taste upon the subject, the object of the writer will have been secured. Around a home thus rendered materially attractive, and pervaded by a spirit of love, the sweetest affections will ever cling, and the outside world offer no rivalry to its sacred joys.

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IN-DOOR ADORNMENTS OF HOME.

By Mrs. John R. Woods, Upper Alton, Illinois.

Dr. Young says,

> "The first sure symptoms of a mind in health
> Is rest of heart and pleasure felt at home."

Home! one of the sweetest words ever woven into poet's lay, or written by the hand of mortal! "Mother, Home, Heaven!" What a vast host of charming associations are conjured up by this trio of simple words! How our hearts throb with emotions of all that is kind, pure and noble, as those blessed names reach our ears! To the young, they speak of present joys, of love, of hope, of wishes gratified, of high anticipations being realized, and of a bright and happy future. To those in life's prime, and in life's sunset, they bring all the reminiscences of "life's young dream;" the sacred home of childhood, where our school days—those days often so sad and dreary, and, to the young, restless, wayward heart, so tedious in their progress—were cheered and brightened by a fond mother's words of sympathy and encouragement. We tread again those early haunts, which memory has daguerreotyped on our hearts with ineffaceable tints. Our father's study, our mother's sitting room, where we first lisped our infant prayers, and were taught, from our earliest remembrance, those pure principles, which, with God's blessing, have made us all we are, or ever hope to be; the parlor, with its family portraits; the center-table, with its fine editions of select books; the worked ottomans; the mantel, laden with beautiful ornaments, foreign and domestic; landscapes painted by fair sisters' hands; these, with the children's pleasant rooms, where thoughtful care and maternal solicitude are manifested in everything that meets the eye; the servants' dormitory; the neat and systematically arranged kitchen, all call up, from the deep fountains of the heart, the scenes and companions of "long ago." And, though four-score years may have come and gone, and the weary wanderer may have passed through sin and sorrow, pain and turmoil, yet that one bright picture of "Mother and Home," illumines the far-back, dim distance with a serene, bright lustre, that no intervening objects have been able to obliterate.

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There can be no home without a mother. It is her province to make home happy and attractive, and to teach her children this beautiful and alluring art, both by precept and example. While the husband and father is cultivating and adorning his domains, and rendering everything out-doors pleasant, convenient and comfortable, or vigorously engaged in his daily routine of city business, let the wife and mother, assisted by her daughters, adorn with their own skillful hands, every room in the house, not even overlooking the kitchen. On its clean, whitewashed or nicely papered walls let a simple wreath of native grasses and dried flowers be hung; let suitable engravings and common paintings fill other vacancies. Thus, if we wish to be useful and benefit our fellow creatures, can we create and cultivate a taste for the beautiful in the works of nature and art, in our hired help. It makes them better men and women, by improving their minds and morals, by giving them self-respect, and by bringing out their latent qualities, and telling them that they, too, when time and opportunity offer, can do much to adorn their own humble homes. Indeed, in our favored land, we have many examples of a large number of this class, in after years, enjoying more than *humble homes*. The tastes imbibed in the homes of their former employers will do much to refrain them from an injudicious outlay for costly, gewgaw toys and gaudy ornaments. Yes, every room should contain some domestic ornament to attract attention by its beauty, its artistic skill, or its economic value. It is truly astonishing to see how many and how various are the beautiful articles of furniture and adornments for the walls of our parlors that can be wrought by our own skill and ingenuity. Aside from the great amount of money saved in this way, which can be expended in laudable works of benevolence, in educational purposes, or in replenishing our libraries, it is a source of unmingled pleasure to be surrounded by the creations of one's own fancy; to view them growing up silently around one, mute companions, to be sure, yet such as give much zest and diversity to in-door life, (especially life in the country) and contribute largely to spend in an agreeable manner many hours that might otherwise prove dull and lonely.

There are comparatively few ladies who are willing to be confined to never-ending domestic drudgery; not many who wish to pore over books till head and eyes refuse further imposition; nor many who wish to bend over their sewing till the poor back and

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for displaying her thrift, her talents and industry. Then her love of home manifests itself in a thousand ways. The care of the precious charges committed to her—their mental, moral and physical comfort and well-being, are more strongly urged upon her consideration, because more entirely thrown upon her own resources than in the spring or summer time, when they can romp and frolic among the works of nature untrammeled by the rules of etiquette or the fear of "making a noise." The lessons there taught by a judicious and Christian mother are seldom entirely lost, but often grow with the children's growth and strengthen with their strength.

It is of the greatest importance that mothers impress upon the minds of both their sons and daughters that each one has a task to perform, to make HOME a word that will be a talisman through all their lives, to keep their hearts pure, loving and cheerful—a place that will in absence draw them back by the fondest memories and most tender associations of the comfort and happiness enjoyed in that dear spot.

We cannot make our homes too pleasant or too beautiful. If God has given us the tastes and the talents, it is a duty we owe to Him and to our families to put forth exertions to make the best use of the countless beauties of creation which He has placed within our reach. These blessings are extended to the poor as well as to the rich. They can pick up here and there along their rugged pathway something to make the place, even though it be a cabin, which they call home, look bright and cheerful. We often see, in the poorest dwellings, broken pots with flowers, or a box fastened to a window-sill with a vine carefully nursed until its spreading leaves cover the window. How our heart warms towards the inmates of that simple abode!

In years long gone by, before the taste of the present day was developed, we have seen, in small cabins, a linen towel of domestic make, neatly ironed with folds and placed behind the small mirror, underneath it a comb-case of wall paper or gaily colored patch-work and strung all around the same, in fantastic shape, birds' eggs of divers colors. It was a subject of merriment to us then, but now we can discern that even there a taste was displayed for home decorations, which, if cultivated in the least degree, might have resulted in something worthy our highest admiration.

Nature is beautiful and ornamental even in her secluded haunts; she has wrought with her industrious hands the vines of the forest into graceful and luxuriant wreaths, carpets of grass for the earth, flowers and mosses to embellish the rocks and the streamlets, and everything that can inspire man to emulate her, and create in him a love for the pure and simple, has been done by this unrivalled artist. So complete and various are the materials thrown around us, that a walk of an hour in the country will supply us with a sufficient quantity to embellish one or two rooms handsomely.

Baskets made of different shapes, covered with mosses, inter-

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spersed with white and purple amaranths, golden eternal flowers, seed pods of weeds, small shells, cyrstalized grasses, acorns, etc., are very elegant and look well, suspended from a chandelier or placed on brackets in a corner of the room. Frames around small pictures, made in the same manner, are very tasteful. Wreaths of colored and crystalized grasses, with dried flowers, placed around oval picture frames, give a graceful and picturesque appearance. Flowers pressed and made in wreaths on white card board resemble the most delicate paintings, but far superior. Forest leaves, with their autumnal tints, pressed until dry, then varnished and attached to a pasteboard frame, form a fine surrounding for pictures, and will retain their beauty for months. Leather work frames can be made in a variety of ways. Some made black, with the leaves closely attached to the wood work, have the appearance of finely carved wood or highly wrought metal. Others, with grape-vine leaves and fruit in colors; others, with the leaves standing out from the frame, and so much resembling natural leaves as to challenge dispute by the beholders as to whether they are natural or artificial. What-nots, those pretty, but somewhat expensive articles of parlor furniture, can easily be made at home, of plain wood, posts of fancy straw work, colored to imitate mahogany, the other parts covered with cones, made into clusters of flowers, leather work and acorns, all highly varnished, until, in beauty of design and elegance of finish, they far surpass any that can be purchased at the cabinet-makers. Handsome stands for the family Bible, and a fit resting place for those splendid gifts of friendship and affection, photographic albums, can also be gotten up by home ingenuity, very much resembling the finest Chinese work. Candlesticks, flower vases, frames, and different styles of boxes can be made of various materials and covered with shells. These are costly when brought from foreign shores, but nature has supplied our own rivers with a good assortment of priceless shells, which, with a little skill in the arrangement, look exceedingly well.

The women of our land are growing more inventive each year. It certainly never entered into the heads of our fore mothers to conceive of the one-hundredth part of the pretty in-door adornments which we now enjoy. They had their tapestry, their tamboured and embroidered pictures, quite content, if, while at boarding school, they waded through some scenes from "The Sorrows of Werter," or "The Prodigal Son." There is no doubt, though, that they were greater utilitarians than we, inasmuch as their household ornaments, in many cases, consisted of knots of well-prepared flax, ready for the wheel; of skeins of fine flax thread; of rolls of linen ready for the bleaching process on lawn, (then called door-yard;) of piles of home-spun blankets; and, in a quiet corner of each girl's bed-room, a stack of very neatly finished bed quilts. Who shall decide which is the more useful method of adorning a plain man's home, the present, or that which prevailed half a century ago?

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What a different atmosphere seems to pervade those houses that are dressed in the handiwork of wife and daughters, and those where everything you look upon is from the upholsterers' or furniture stores. How stiff and cold they all look, especially if the chairs and sofas are decked in their linen or nankeen coats, as if saying, "Be very careful of me, for I cost a vast amount of money!" Ah, me! how lonely we feel in such a place! No home feeling gushing up in our heart; nothing to look at, but what strange, mercenary hands have made; no cozy nook with a sample of rural beauty to greet the searching eye, or cheer the longing, home-loving soul.

Said a gentleman in our hearing, a few days since, while admiring some parlor decorations, "Our old home was a plain one, but it was made beautiful by the skillful hands of my sisters." What a compliment to those sisters! Years have passed since they sat together at their father's fireside—the vicissitudes of life have swept over him, and sorrows have been his, yet his heart turns with a lingering pleasure to those rooms, so neatly fitted up with pictures, baskets, mats, hearthrugs, all made by the hands of those dear inmates. Think you not that he is a better man by these retrospects of his early days?

These accessories and home adornments have a great influence in cultivating literary tastes in the minds of the children. They excite pleasurably and wholesomely their imaginative and meditative powers. While engaged in composition, as the eye rests upon fine pictures, bright flowers and choice statuary, many chaste and lovely ideas are suggested, noble passions inspired, and themes for future use originated. Surrounding objects often have a material effect on the mind of a writer, in furnishing eloquent expressions, and a fine finishing to his subject. Let us, then, throw around our husbands and children everything that will assist in developing their mental resources. Let mothers and daughters earnestly endeavor to scatter such attractions around the atmosphere of home, in-doors and out, as shall link the hearts of the family so closely in bonds of happy union that no power on earth can break or weaken them. But, at the same time, let it be borne in mind, that all the elegance of rich and costly furniture, and all the embellishments of domestic art combined, without loving hearts, can never constitute a home. Byron says, in one of his poems:

> "He entered his house—his home no more—
> For without hearts, there is no home."

We are happy to remark, however, that, so far as our observation extends—and it has not been limited, by any means—true, happy, loving hearts, overflowing with love to God, to man, to country, are the very ones who most assiduously put forth all their efforts to make home a "thing of beauty and a joy forever."

But the first, the best and loveliest "In-door Adornment of Home," is a group of healthy, intelligent, well-trained children,

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who fill with ease and grace every department of the household; who adorn niches, either in parlor or kitchen, as circumstances may require; whose chief delight is to lighten the cares of their parents, to render each other happy by mutual acts of endearment, and who tender to strangers and visitors all the elegant courtesies of a hospitable Christian home. Such ornaments, like those of the celebrated Cornelia, of historic memory, are jewels, of better metal, of higher polish, of more enduring loveliness, of more intrinsic value, than any adornments of which our minds can conceive or our hands can form. Such adornings God and angels look upon with delight and approval, and man, with a pleasure that is unalloyed and full of holy and lofty hopes.

Last, but far above all other requisites and adornments of home, is a husband who spends his evenings in the midst of his family circle, enjoying, with them, the literature of the day, music and "converse sweet;" one who uses no profane language, drinks no intoxicating liquors, and who neither smokes, chews, nor snuffs the foul weed, consequently does not soil the richly wrought hearth-rug, (the pride of his wife and daughters) nor disfigures, with unsightly blotches of expectoration, the richly polished stove and oil-cloth.

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AGRICULTURAL COLLEGE.

By Richard Edwards, President of the Illinois Normal University.

To every people, the perfection of the means and methods of tilling the soil is a matter of the first importance. Agriculture lies at the foundation of all national greatness. It is the basis of all other enterprises. To feed a people is the first great end to be accomplished. A man can do nothing with hand, intellect, or soul, as long as he is famishing. Hungry men and hungry nations always have been, and always will be, found ready to sell their birthrights for a mess of pottage; and no logic or fine sentiment can restrain them from the sacrifice. Indeed, fine sentiment, profound logic, the noblest thoughts, are thrown away upon men in this condition. And as food is the first necessity of man, so whatever energy he possesses must be at first devoted to securing it. All culture of mind or soul must be postponed to this. And how many there are who never get beyond this first, this animal stage, of their being! whose eternal warfare with want leaves them no leisure for higher and nobler pursuits!

But here civilization comes in with its inventions and improvements, its combinations and exchanges, its philosophy and its labor-saving machinery, and so cheapens the whole process of producing food and clothing, that man has leisure left him to turn his attention to the wants of his mind—to the study of those higher and nobler relations of his, which ally him to higher beings, and call forth the nobler faculties of his own soul.

Hence the eminent propriety of industrial schools, and even the imperative necessity for them. Nature is full of grand possibilities. She has scattered, broad-cast, the most golden opportunities for saving labor, and shortening the distance between her own virgin supplies and the richest delicacy or the finest fabric. Her torrents plunge along her hill-sides with a power to drive thousands of mills, exclaiming, in their tones of resounding thunder, "Here, O, man, are we ready and willing to be harnessed to the car of social improvement!" What tremendous forces are bound up and packed away in our coal-beds! What magnificent possibilities in

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a ray of light, as it infuses its own genial life into the dull, cold soil, and blossoms forth into leaf, and flower, and seed! How, in reference to all these, too, nature is constantly inviting man to question her! nay, is even urging him to do it, and spontaneously pouring out before him rich supplies, as an earnest, a foretaste, of the treasures that shall accrue to him who becomes a faithful and diligent inquirer into her mysteries! But man, uneducated and undirected, stumbles to no profit upon the most glorious opportunities. He stands over the cataract, and sees in it only so much worthless foam, and hears in it only so much equally worthless noise. The black dirt that crops out among the carboniferous rocks is sadly in his way, as he scratches the surface of the earth in his miserable substitute for scientific plowing. Through how many centuries, and among how many nations, has agriculture been the merest sham, prosecuted from the sheerest and most ignoble necessity, and by the most ignorant and degraded of mankind! Who can count the millions of acres of fruitful fields, blooming in the joyous sunlight, laden with untold treasures of fruit and grain, that have been turned into dull and barren deserts by the ignorant violations of natural law exhibited in the vicious processes of tillage? Where shall we look to-day for the gardens of the ancient world? for that plain of matchless fertility, that sustained the teeming millions of the Assyrian and Babylonian empires? for that land "flowing with milk and honey," which, in the time of David, nourished within its narrow limits (a space not exceeding in area the State of Maryland) a population of some 5,000,000? Where shall we look even for Eden itself—that gorgeous type of celestial glory? Of all these, the sites remain. The ruins of Nineveh have been explored. The place of Babylon has been found. The Holy Land is accurately described in multitudes of books. But, alas! their glory has departed! Not only have their works of art—the palaces of Semiramis and Sardanapalus, the hanging gardens of Nebuchadnezzar, the impregnable walls of the Chaldean capital, the stupendous temples of Belus—not only have all these crumbled under the weight of centuries, but even the physical glory of these once favored regions has faded out. The soil has been cursed by human imbecility. The rich fields of ancient time have become sterile wastes of shifting sand, supporting a scattered remnant of miserable, homeless, wandering Bedouins, in number less than one-tenth of the ancient population.

And does it not become us to ponder upon these terribly significant facts in history? We, too, dwell upon a vast plain, of apparently inexhaustible fertility. It is capable of nourishing upon its broad bosom a population of many millions. It is no exaggeration to say that its resources are beyond the power of computation. It has evidently been prepared by the divine hand to be the abode of countless multitudes of freemen. But are we sure that even these plains shall escape the blight, the dreary sterility, that follows vi-

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cious tillage? Is it not in the power of imbecility—for imbecility is marvelously strong in certain ways—is it not in the power of imbecility to exhaust the fertility of even the prairies of Illinois? On this head, I suppose, there can be no possible question. And further, I suppose there are modes of culture now in use among many of our farmers, that tend directly to this result, and that, if persisted in, will make it as difficult for the future antiquarian traveler to find the ruins of Chicago, as it has been for modern adventurers to discover those of Babylon. It seems that men always have needed, do now need, and always will need, instruction in this matter of tilling the soil. The results of observation by intelligent men, of scientific experiments upon the chemical ingredients in soils, in water, in the air, and in plants—these results must be collected, considered by competent minds, compared with actual experiments in the field, and the best results attainable from all these sources must be given to the young men who propose to devote themselves to the honorable and time-hallowed business of agriculture. They will thus enter upon their work at a vast advantage. They will start where their predecessors left off. The experiments they make will be conducted in the light of all past experience, and they will be spared the necessity of repeating the blunders of past ages.

We need, then, an agricultural school—an institution that shall devote itself to the enlightening of our people on this subject—that shall save our noble State from the curse of imperfect and vicious culture, and shed the light of science upon the hitherto untaught efforts of the agriculturist.

And what is an agricultural college? Let us begin by stating some of the things it is not. And first, it is not the back shop, nor even the front parlor, of any other college. It is an institution *sui generis*. The highest success can only be secured for it by setting it upon its own feet, and taking it out of all manner of leading strings. It must be endowed with the full attribute of an independent manhood. For this there are multitudes of reasons. One of them is that every institution of learning, like every other organism, has its chief and guiding purpose—its one great aim and end—to which all other aims must be subservient. If agricultural college is annexed to some existing institution, what is to be the main object of the compound institution? Is it to be literary or agricultural? If literary, then, of course, the agricultural department suffers, from being subordinated. If the agricultural, then the same department suffers from being encumbered with the literary department. What earthly good can come to an agricultural college, with its model farm, and manual labor therein, to have on its hands a thing so little in unison with its active out-door purposes, as an academic appendage where boys are taught Greek accents, and the quantity of Latin syllables? In either case, whether

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the agricultural department is subordinated or exalted—and one or the other it must be—the result is alike injurious.

And what does experience say to us on this point? What has been, in this country, the general effect of the attempt to graft a special school of this kind upon the stem of a literary institution? Let me illustrate the point by reference to the normal schools of the country, which are much more closely allied to our colleges than an agricultural school can be. Of all the attempts—and there have been several made in the United States—to annex State normal schools to colleges or universities, very few have been successful; and in these few, the union was merely nominal, and has not been in operation sufficiently long to test its permanency. That plan was adopted in Kentucky, Rhode Island and elsewhere, and in almost every instance abandoned. Quite recently, in the States of Wisconsin and Iowa, normal schools have been established, having a nominal connection with the State universities, but, as I understand it, virtually independent. And the arrangement was consented to in these States, because separate appropriations for the normal schools could not be obtained. And the permanency of the arrangements yet remains to be tested. The normal department of the Chicago High School is a city matter, and is, so far as I know, the only one of its kind.

On the other hand, I am not aware that a single independent State normal school, even though established as an experiment, has ever been discontinued within the entire limits of the United States; and some of them have been in operation twenty-five years. And I believe that what is true of normal schools will be, *a fortiori*, all the more true of agricultural colleges, inasmuch as they are less allied to common colleges.

But this is only illustration. How can we best get at the convictions of the best agriculturists on this point? By observing what they have actually done themselves in respect to the matter. What has been the general practice in our times? Have most of the agricultural schools established within the last eighty years, in Europe and America, been independent? or have they been annexed to some existing institution? The investigation develops the most remarkable unanimity of sentiment, and uniformity of practice. I have before me at this moment a list of twenty-six of the most eminent and successful of these institutions, on both sides of the water. From this list I am satisfied that no institution of first grade is omitted. And of the whole twenty-six, only one—that of Pisa, in Italy—is made in any degree dependent upon a college or university. The others are independent agricultural

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from considerations of common sense, applied to the investigation of the question, from the analogy of other institutions, and from the actual opinions of eminent friends of agricultural education, we derive the same unvarying conclusion: that an agricultural college should stand upon its own foundations, and should be thrown into no position of dependence or partnership.

In this discussion, I raise only one question, and that is, "How can the proposed institution be so established and circumstanced as to accomplish, most efficiently and fully, the object that all have so much at heart: the improvement of agricultural science and practice in the State of Illinois. And, as I understand it, this is the only question that ought to be raised. No other interest has any right to be heard in the discussion, except the great farming interest of our noble commonwealth. The question whether existing institutions may or may not be helped, by one method or another of disposing of the magnificent fund that has just come into our possession, is not to receive one moment's attention at our hands. The whole matter is remarkably free from any complicating considerations. It is simply one plain, clearly defined point: "How can we so dispose of the fund as best to promote agricultural education?" The whole question is just this, and nothing more.

As to the colleges, our disinclination to involve them in this discussion does not arise from any unfriendliness toward them. I, for one, will never join in a crusade against them. No man can estimate the good which this nation has derived from their efforts in the conservation of civilization. I believe that the education imparted by them has exerted a vivifying and ennobling influence upon the public mind of the nation. Had it not been for the first colleges established upon the shores of the New World, by men of large hearts and clear heads—seers, who could discern the far future through the mists of ages—there is no knowing to what depths of barbarism the early settlers of this country might have fallen. We praise God for colleges, and bless the men whose memories are made fragrant to us by being nobly associated with their history.

But the fact that I value my Herodotus does not make it necessary that I should consult him on matters relating to railroads and the magnetic telegraph. Because I love my Shakspeare, I do not feel bound to go to him for my chemistry or theology, though perhaps I might go to a worse place for both. A pair of shears is useful; but when we have a hundred acres of wheat to cut, we prefer a McCormick or Manny. Every good thing has its use; but a college, I am confident, can be better employed than in nursing the fund set apart for agricultural education.

We need, then, an independent school—one that shall be at liberty to adjust its forces to the accomplishment of its one great end: the improvement of agriculture in our State.

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But this is not all. We need not only an independent institution; we also need, under the circumstances, a single school. Our State is large, and it might, on some accounts, be thought desirable to divide the agricultural college, so as to bring its advantages more within the reach of the citizens of every portion of our extended territory. But a careful look at the matter in all its bearings at once reveals the impossibility of this. Our fund is to be derived from the grant of 480,000 acres of land by the Government of the United States. For this, I am told that forty cents an acre will, in all likelihood, be a large price. This will give us a fund of $192,000, yielding an annual income, at six per cent., of $11,520. This, for a single institution, may, by economical management, furnish a tolerable support, at least for a time, provided farms and buildings can be supplied from other sources. But if an attempt be made to divide the income into two or more parts, the effect will simply be greatly to impair, if not wholly to destroy, the efficiency of both. The State of Illinois deserves the best agricultural school on the continent. Now, does any one suppose that, with $5,000 per annum, we can maintain such a school anywhere in this State? In this land of intelligence and progress, knowledge and talent do not languish in unproductive obscurity. Our universally diffused culture, however imperfect it may be, is yet sufficient to whet the public appetite for higher attainments. Every man who is supposed to be, in deed and in truth, wiser or more skillful than his fellows, is honored, caressed and paid. Louis Agassiz, if he could spare time to make money, could no doubt secure a salary greater than that of the President of the United States. And shall we hope to secure the scientific attainments, the skill in investigation, the ability to instruct, that will be needed in an institution requiring a corps of professors, representing agriculture in all its phases—theoretical, practical and experimental—for such a sum as the half of the annual income from our fund? Scientific men, in common with others, have a habit of listening to higher calls, and of consequent change of residence. We must not make our State, in this respect, a good one to emigrate from. Rather let us make it the great converging focus of intellectual light and progress, as it is the center of material wealth and resources, in the sisterhood of commonwealths. We don't want a brace of one-horse institutions.

And what shall be the precise functions of our single independent school? What course of study shall be established, and to what extent shall it be devoted to theoretic study, and to what extent shall we aim to introduce practical and experimental work?

First, then, we must have a model or experimental farm, if not

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constant in the details of her operations as to make it certain that a process found to be best for raising wheat in Pennsylvania or the Grand Duchy of Baden, and recorded in books, will be the best for Illinois. The record of what has been elsewhere done is useful to us in directing our own efforts, but not in assuring us of exact results. Now, whether it will be best to require the young men to work on the farm a certain time, say three hours per day, as is done at the school near Bellefonte, in Centre county, Pennsylvania; or whether they shall only be required to keep a careful account, derived from observation of all the operations performed upon it, is an important question, and one the solution of which will depend on circumstances. It is not necessary at this early stage of the proceedings to come to a definite decision upon it. But the latter of these alternatives must in any event be insisted upon. Every student, after having been taught how, must be required, at some time in his course, to observe with care and minuteness every agricultural process, as for example, the raising of a crop of wheat. His record, made in his own hand-writing, and the result of the use of his own eyes, or other senses, must furnish answers to questions like the following: In preparing for sowing the crop, what was the first thing done to the field? When was it done? Why was it done? What was the condition of the ground just before it was thus treated? What was next done? Next? etc. When was the seed sowed? How? What kind of seed? How much to the acre? Why sowed at this time and in this manner? What method was employed for covering the seed? Why? How long was it germinating? Is this the usual time? What changes did it undergo from this time until harvest? At how long intervals of time? Did it receive any further treatment before harvest? Did it suffer injury? If so, to what extent and from what cause? And thus on until the grain has been threshed and cleaned.

I do not mean to say that these identical questions would be the best to ask. A practical farmer or a man of science could no doubt suggest much better ones. But I insist upon some tests that shall throw the student upon his own resources, that shall make it certain that he has come legitimately by what he knows or thinks he knows. So much of the work of education is done vicariously—by proxy—so much of the knowledge of our students has been simply borrowed from the professor or from the book, there are so many ideas in the world that have only been adopted and never cost their pre-

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According to the New American Cyclopædia for 1862, the best appointed agricultural school in America is the Agricultural College of Pennsylvania, located near the town of Bellefonte, in Centre county, very near the geographical centre of that State. It is presided over by Dr. Evan Pugh, who seems to be a gentleman highly distinguished for his scientific attainments. It has five professors, two assistants, and five superintendents of farm, nursery, garden, etc. The professorships are: 1st. Chemistry, scientific agriculture, mineralogy and geology. 2d. English language and literature, and moral and intellectual philosophy. 3d. Botany, physiology, zoology, horticulture and gardening. 4th. Mathematical sciences. 5th. Science and art of veterinary surgery. The two assistants are in analytical chemistry. The course of study occupies four years, and the student who passes successfully all the examinations and presents an acceptable thesis, receives the degree of Bachelor of Scientific Agriculture. An additional year of study entitles him to the degree of Master of Scientific Agriculture. There are partial courses, without degrees, to such as are unable to take the whole course.

The studies of the first year are arithmetic and elementary algebra, horticulture, elementary anatomy and physiology, physical geography and elementary astronomy, English grammar and composition, elocution, history, practical agriculture and details of management on the college farm. Of the second year, advanced algebra and geometry, general chemistry, vegetable anatomy and physiology, zoology and veterinary surgery, geology, paleontology, practical agriculture and horticulture, logic and rhetoric. Of the third year, surveying, navigation, levelling, drafting, (with the use of instruments,) analytics, trigonometry and calculus, natural philosophy, chemical analysis, veterinary surgery, entomology, agricultural botany, practical agriculture and pomology, political and social economy. Of the fourth year, analytical geometry, differential and integral calculus, engineering, drafting, mechanical drawing, quantitative chemical analysis, veterinary pharmacy, gardening, agricultural accounts and farm management, moral and intellectual philosophy. Every student is required to perform three hours' manual labor on the farm, or in the garden, nursery or orchard daily. In 1862, there were 110 students.

I am not prepared to state at this moment how near, in my opinion, this course would come to meeting our wants in this State, nor how much of it would be irrelevant and out of place here. These are points that would require long and careful consideration.

I shall add but two more thoughts. The first is that the instruction imparted in our school should be free. Its doors must not be closed against the poorest child within the limits of our commonwealth. In the older States it frequently happens that the expense of attending schools of this kind is so great that none but persons of comparative wealth can enjoy their benefit. Boys who, had

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they received the proper instruction, might have become eminent as agriculturists, and whose services might, consequently, have been of untold value to the community, have, by neglect, grown up in ignorance and, possibly, in vice. Society is frequently deprived of the most efficient services that could be rendered to it by this exclusive and undemocratic policy. With us this should not be. Our education, in all its forms and departments, should faithfully represent and cherish the great fundamental idea of our government—the equal right of all citizens to a participation in the benefits of the government and of all public institutions. But this does not, of course, preclude a proper distribution of the students to different portions of the State.

The other thought is, that in such an institution we should place a comparatively strong emphasis upon the English language and its literature. The language of a people is an exponent of its no blest thoughts and highest life. It is a reflex of the best part of their character. Comparatively little of what is low, mean or unworthy in the national life finds expression in the language, except, perhaps, by inference and implication. And every man that has the English for his mother tongue, has reason to thank God for the noble inheritance it brings him. It has a literature that satisfies every want of his mind, a literature that breathes on almost every page the spirit of a sturdy freedom, a literature that has less of abject truckling to tyranny, whether in government or in opinion, than that of almost any other people. Our practical men need its influence upon their minds. They need to breathe its elevating and refining spirit to be aroused by it into a noble emulation of the worthies who have spoken it.

Again, our farmers need a thorough and somewhat extensive acquaintance with English, for another reason. Language is the mightiest weapon in the hands of him who would exert an influence among men. We may say as much as we please that the man of solid sense ought to rule in popular assemblies and in deliberative bodies. We know that the man of skillful speech does so rule. Enter the political arena. Whose ear is greeted by the longest and loudest plaudits? Who counts up the largest majorities? Not necessarily the man of soundest political faith, who fortifies his positions with the strongest logic. It is much more likely to be the man who can most skillfully array his forces of nouns and verbs so as to take captive the emotions, and it may be the reason and judgment of the multitude.

Every man must be struck with the vast preponderance of lawyers in our places of honor and trust. It seems as if they held a sort of ownership in our national and state offices, an ownership which they occasionally, but somewhat rarely, waive in favor of men in less lucky pursuits. Why is this? It arises unquestionably from the facility which lawyers acquire in the use of language. This is the key that opens to them at once the public treasury and

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the hearts of the people; the weapon with which they beat down all opposition, whether of sound sense and logic, or of prejudice and sophistry.

And this power the farmers of our State ought to possess. Their education ought to fit them to take a leading part in the political affairs of both state and nation. There are, no doubt, lawyers who are warmly and earnestly interested in agricultural matters, and in whose hands these interests are undoubtedly safe. But is this any reason why farmers, as a class, should be incapable of wielding the influence necessary to enable themselves to take care of their own interests.

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CHEMICAL CHANGES OF PLANTS.

SOME OF THE CHEMICAL CHANGES THAT TAKE PLACE IN THE GERMINATION, GROWTH AND DECAY OF PLANTS.

By J. A. Sewall, of the Illinois State Normal University.

When we look out upon the earth and behold the amount and variety of its vegetable products, from the rank tangled vine of the jungle of India, to the close-leafed date of the Arabian desert; from the luxuriant growth of the Amazon valley, to the high peaks of the Andes, where life and death seem struggling for the mastery, and the crisp lichen proclaims the last faint victory of life, we wonder and admire. And, when we reflect that the peculiar vegetable proximate elements—chemical compounds are more numerous and varied than the species in the vegetable kingdom—we are lost in the comtemplation of this almost infinite variety. And to one who simply observes these *facts*, without understanding the laws of chemical affinity, and chemical combination, the investigation of the phenomena, would be more than a life-long, and, at the same time, a profitless task.

Nature needs but few forces, requires but a limited number of elements to produce an almost infinite number of results. Heat, light, electricity and affinity are the forces; oxygen, hydrogen, nitrogen, carbon, etc., are the elements. In fact, not more than sixty-four elements in all, while nine-tenths of all the vegetable products are constructed from the four we have specified—from the deadly prussic acid, to the wholesome and nutritious starch and gluten of the grains of our prairie farms.

As the figures of the Arabic, or the letters of the Roman system of notation are combined, so as to represent an infinite variety of numbers, so are these few chemical elements combined, through

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the agency of the forces we have mentioned, to produce this vast number of vegetable compounds.

We purpose in this paper to observe some of the chemical changes that take place in the germination, growth and decay of the vegetable, and thus be better able to understand how plants growing in the same soil, watered by the same rains, fanned by the same breezes and warmed by the same sun, develop elements possessing properties differing so widely.

In the investigation, we can but observe that the Creator's works are all in accordance with fixed and perfect laws, indicating, beyond all doubt, that a *creative plan* preceded the *Creator's act*, and in studying the plan, we are permitted to read the thoughts of God!

The growth or development of the plant may be conveniently divided into four periods.

First. From the germination of the seed to the development of the plumule and radical. This may be called its *dependent* existence.

Second. From the appearance of the stem and root to the development of the flower.

Third. From the development of the flower to the ripening of the fruit.

Fourth. From the maturing of the fruit to the decay of the annuals, or to the preparing and storing of food in the perennials.

In order for a seed to germinate, it must be situated so as to be abundantly supplied with water; it must be exposed to a certain degree of warmth, and supplied with air. Light, on the contrary, prevents germination, for reasons we shall presently explain. Water is necessary to dissolve the solid matter in the seed, and to overcome by its mobility the inertia of the particles of matter; for nothing can enter into the tissue of any organic body, except in a state of solution, or very minute mechanical suspension. And as water is the "universal solvent," it readily dissolves the solid matter, and its great mobility overcomes the inertia of the particles of matter, and thus prepares the way for a change of form—a rearranging of the atoms. Not only is water necessary at this time, or period of germination, but at every period of growth, and even decay.

A certain degree of heat is, also, a necessary condition of germination and growth, although the degree of warmth is far from being a constant quantity. Flowers bloom upon the Siberian plains, where the temperature is little above the freezing point; the *fuschia* and *veronica* flourish in Terra del Fuego, where the temperature is only 36 deg. F. While in Norway, during their short summer, where the temperature rises to 108 deg. F., where it is even hotter than under the sky of Southern Italy, vegetation develops with wonderful rapidity. As to the *degree* of heat, we can only say that seeds will germinate if the temperature be above the

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freezing point. The seed does not, however, depend entirely upon the surrounding media for its warmth, for it has the power of generating heat within itself. The heating of grain when wet and exposed to a certain degree of heat, is a phenomenon familiar to all. Now, as the moisture and heat are favorable to the processes of germination, the grain "sprouts" and heat is generated; precisely the same thing takes place when a single seed sprouts or germinates. The transformation of starch or gum to sugar, is more readily effected in the presence of a certain degree of heat, a change which is necessary before the germ can be nurtured by the food stored up in the seed.

If seeds are entirely excluded from the air they refuse to germinate.

If buried far beneath the surface, they remain unchanged or decay, and plants are frequently observed to spring up from earth that has been thrown up from considerable depth, indicating strongly, if not proving, that the exclusion of the air had prevented germination.

Light seems to antagonize the germinating force, for if seeds are placed in conditions favorable to their growth, but exposed to light, they will not germinate. Seeds, during the process of germination, absorb oxygen and give off carbonic acid; that is, a portion of the atoms of carbon are oxydized, and *oxydation* is but another name for *combustion*, and combustion produces heat. Now light effects an opposite tendency, viz: to deoxydize the carbonic acid, or resolve it into its primary elements, carbon and oxygen. Thus we see why light prevents germination—why the farmer always covers the seed, well knowing the *fact*, without understanding the *philosophy*.

And we here also understand why *air* is necessary. As seed cannot germinate unless the atoms of starch in the seed become oxydized, the air must furnish the oxygen, because the seed in the plant has not the power of decomposing water to furnish it. During germination acetic acid and diastase are formed.

If a seed is made to germinate in a quantity of powdered limestone (carbonate of lime) a quantity of the acetate of lime may be detected in the soil about the plant, showing that it had been formed in the seed and then deposited in the soil.

Diastase is a peculiar body formed at the base of the germ during germination. It has the power of converting starch into sugar, a process necessary for reasons we have given. The office of the acetic acid is not well understood. The seed consists, for the most part, of starch; this is converted into sugar by the action of the disastase. We know sugar is present by the sweet taste of the little plantlet; the sugar, however, cannot become converted into woody fibre until the appearance of the true leaves. The composition of starch is, carbon 12, hydrogen 10, oxygen 10. Sugar, carbon 12, hydrogen, 12 oxygen 12, then by adding two

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atoms of the elements of water, (oxygen and hydrogen,) to the starch, we have sugar. This sugar, dissolved by the water which is abundantly supplied by the roots, is carried by the circulating apparatus to every part of the organic tissue.

We now discover woody fibre in the growing plant. Its composition is, carbon 12, hydrogen 8, oxygen 8. The sugar which is dissolved in the sap, by losing four atoms of the elements of water, becomes converted into woody fibre. Thus, carbon 12, oxygen 12, hydrogen 12, minus four atoms of hydrogen and four of oxygen, becomes carbon 12, hydrogen 8, oxygen 8.

In the perennials, after the disappearance of the leaves in the fall, the elements of but *two* atoms of water are removed, and the fibre becomes converted into starch, and is stored up in the plant for its nourishment, to be used the succeeding spring.

Liebig says that the starch granules may be distinctly seen in the willow in autumn with the aid of an ordinary microscope.

The process of forming acetic acid from the starch of the seed, is also very easily explained.

Starch consists of carbon 12, oxygen 10, hydrogen 10. Acetic acid, of carbon 4, oxygen 3, hydrogen 3. Thus, from one atom of sugar, we have three atoms of acetic acid, with the elements of one atom of water eliminated.

These are the changes observed in the seed. The plant has now entered its sphere of *independent* existence—it is born. The method of growth still seems the same, and the elements of nutrition are the same, but the chemical processes are entirely different. The starch stored up in the seed is all consumed, and now the plant must depend upon the soil and air for its food. The leaf of the plant, in the sunlight, absorbs carbonic acid and gives off oxygen. We have observed that seeds will not germinate if exposed to sunlight, because the atoms of carbon in the starch could not be oxydized; but now, in the independent existence of the plant, light *deoxydizes* the carbonic acid of the air, retains the carbon and gives off the oxygen. The carbon unites with water in various proportions, and forms a very large number of vegetable compounds.

We will mention a number of these and give their composition, and then explain the chemical processes. Cellulose, fecula, inuline, lichenine, gum. These bodies have the same chemical composition, viz: carbon 12, hydrogen 10, and oxygen 10, yet possess different properties.

Now suppose we conceive twelve atoms of carbonic acid, (or twelve atoms of carbon united with twenty-four atoms of oxygen,) uniting with ten atoms of water, ($H._{10}$, $O._{10}$,) we have carbon 12, oxygen 34, hydrogen 10=($C._{12}$, $O._{10}$, $H._{10}$,)+oxygen 24, or twelve atoms of carbonic acid, with ten atoms of water, gives one atom of cane sugar and twenty-four atoms of oxygen set free; then this sugar, by losing two atoms of the elements of water, becomes con-

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verted into wood or woody fibre. Regnault says that carbonic acid dissolved in water is taken up by the roots and decomposed in the leaf, in the same manner as that furnished from the air.

These chemical changes show us how the elements are furnished, and how combined to produce the sugar, starch and the wood, three of the most important bodies in the plant.

It has been observed that the starch stored up in autumn, in the perennials, is furnished by the descending sap, that is, after it has circulated in the leaf, or has been digested. Now in the laboratory we observe that nitric acid has a tendency to change starch into woody fibre. And if we attribute this action to the nitrogen in the acid, we may suppose that the nitrogen of the air tends to perform the same office in the organic tissue.

We will now briefly notice some of the changes observed in the third period—from the opening of the flower to the ripening of the fruit and seed. The flower absorbs oxygen and gives off carbonic acid; and it will readily be inferred from what we have said that an elevation of temperature will be one of the results of this chemical action. Experiment also proves this to be so, for if a large number of flower buds are collected into one mass, and in this condition develop into flowers, an elevation of temperature is observed amounting to thirty or forty degrees.

In the ripening of the fruit some of the chemical changes are very easy to comprehend. Take for instance any of the pulpy fruits, such as the grape or apple. When the fruit first appears it is nearly tasteless, or has the taste of the leaf or bark. Now the office of the green hard pulp is nearly the same as that of the leaf, in fact, in the young apple, the pulpy part is nothing but the thickened calyx. At a later period the fruit has an acid taste, and, lastly, a sweetish taste, though the acid taste never entirely disappears until the process of decay has commenced.

Let us briefly examine the chemical changes that take place in these several stages. In the first, or green stage, the fruit consists of little more than cellulose or leaf tissue; its office then, as we have said, is like that of the leaf, viz: decomposing carbonic acid, and appropriating the carbon which unites with the elements of water forming woody fibre. In the second, or acid stage, in the grape, we have tartaric acid; in the apple, malic acid. The composition of the former is, carbon 4, hydrogen 2, oxygen, 5. Of the latter, carbon 4, hydrogen 2, oxygen 4. These acids are formed from the elements which exist in the plant, by the addition of the elements of water and carbonic acid and the evolution of oxygen.

Thus four atoms of carbonic acid, uniting with two atoms of water, gives, carbon 4, hydrogen 2, oxygen 5, plus five atoms of oxygen evolved or set free. To form malic acid we have only to eliminate an additional atom of oxyen. Thus, four atoms of

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carbonic acid and two of water, give, carbon, 4; hydrogen, 2; oxygen, 4, plus six atoms of oxygen evolved.

The two formulæ may be thus represented: Tartaric acid: $(C._4 O._8) + H._2, O._2, = (C._4, H._2, O._6,) + 5$ oxygen set free. Malic acid: $(C._4, O._8,) + H._2, O._2, = C._4, H._2, O._4, + 6$ oxygen set free.

We now come to the third or sweet stage, in which the chemical action is again reversed, the fruit *absorbing* oxygen and giving off carbonic acid.

Thus, taking six atoms of tartaric acid, and adding six atoms of oxygen, we have, $C._{24}, H._{12}, O._{24}$, equal to one atom of grape sugar and twelve atoms of carbonic acid, or $(C._{12}, H._{12}, O._{12},) + 12 (C. O._2,)$ or twelve atoms of carbonic acid. If the change takes place in the malic acid, we have six atoms of malic acid, equal to $(C._{24}, H._{12}, O._{24},)$ uniting with twelve atoms of oxygen, producing one atom of grape sugar, or $(C_{12}, H._{12}, O._{12},)$ and twelve atoms of carbonic acid, or $12 (C. O._2,)$ In both these cases the carbonic acid is given off and the sugar retained in the fruit.

We now come to the fourth period, the period of decay. The chemical changes observed in the preceding periods are directed and controlled, to some extent, by a principle of which we know very little, but call vitality or the vital principle. *Now* the plant is subject to pure chemical forces. The atoms of carbon and hydrogen are now *all* attacked by the great destroyer oxygen, and thus the woody fibre, the sugar, the starch, are all resolved back into the elements from which they were formed—carbonic acid and water.

The process of decay is modified and controlled somewhat by art, but never entirely prevented. Thus, the juice of the apple being expressed and allowed to remain for a short time exposed to the air, becomes converted into alcohol and carbonic acid. These bodies are derived from the sugar in the juice. Thus, one atom of grape sugar is resolved into two atoms of alcohol and four of carbonic acid—carbon 12, hydrogen 12, oxygen $12 = 2 (C._4, H._6, O._2,)$ or two atoms of alcohol, $+ 4 (C. O._2,)$ or four atoms carbonic acid.

The carbonic acid escapes, and the alcohol remains combined with the water. If this is exposed to the air the alcohol absorbs oxygen, and becomes converted into acetic acid (or vinegar) and water. Thus, one atom of alcohol plus four atoms oxygen, equals one atom of acetic acid and three of water, $(C._4, H._6, O._2,) + O._4, =$ $(C._4, H._3, O._3,) +$ oxygen 3, hydrogen 3, or water.

Sometimes, under peculiar circumstances, we observe another chemical change in the decay of the plant, giving rise to a new body, viz: light, carburetted hydrogen. Its composition, one atom of carbon united with two of hydrogen. One atom of woody fibre, uniting with four of water, produces six atoms of carbonic acid and six of carburetted hydrogen—or one atom of tartaric acid, by taking on one atom of oxygen, gives three atoms of carbonic acid, and one of carburetted hydrogen.

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These are some of the chemical changes that take place in the development of the plant. In the annuals *all* these are observed in a single season, while in some of the perennials, as a species of the yew, we have a repetition of these changes for six thousand years before the process of decay commences—before the plant is surrendered to pure chemical forces—the vitality of the vegetable directing the processes for this long period.

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ESSAY ON BREAD MAKING.

By Mrs John R. Woods, Upper Alton.

The Holy Scriptures tell us that "bread strengtheneth man's heart," and that "bread is the staff of life," showing that it is something necessary to sustain the body as well as the heart. The word first occurs in the third chapter of Genesis, at the expulsion of Adam from the garden of Eden. It is found in the Scriptures more than one hundred times, in most cases as a common term for all food.

It is impossible now to speak with any degree of certainty of the date when raised bread first came into use. But the fact that Moses, at the institution of the Passover supper, commanded the Jews to abstain from leavened bread, and eat only unleavened, shows that they were accustomed to fermented or *raised* bread.

From ancient history we learn that the Greeks were taught the art of bread making long before the Romans, who took from Macedonia Grecian bakers into Italy. From Rome the art gradually found its way over considerable portions of Europe. Bread has been, from the beginning of man's advent on earth, in every portion of the world, and every period of time, one of the first, most important and most universal articles of food.

The materials for making bread are different in different countries; we will not enumerate them at this time. In our country, wheat, by unanimous consent, is deemed the best article for bread making, and "it is a remarkable fact that wheat comes nearer to man than perhaps any other plant in its power of becoming adapted to different climates, over a wide extent of earth's surface, so that it may almost be said, that wherever the human species can flourish, there wheat can be cultivated."

All who have had experience in bread making, and have been close observers, know how intimately connected it is with the dearest interests of our families; such will not feel that any reasonable amount of care and labor is *too great* to secure *good bread*, to make which, good materials are indispensably requisite.

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First, good wheat, thoroughly cleaned and well ground into flour; then good, brisk, sweet yeast. This is made in a variety of ways; some persons preferring one kind, some another, but they generally succeed best with that to which they have been accustomed from early life. Brewers' yeast, though much more rapid than any other, is objected to by some on account of the many impure and poisonous drugs used in the manufacture of beer, and which they think, more or less taint the yeast. Milk yeast and salt rising make beautiful bread, but they require a knowledge of their nature and the utmost care and attention in the making and baking of the bread, or the results will be most provoking and unpleasant. Hop and potato yeasts are both excellent, and very popular in this part of our country. The process of making is well known. It would require more space than can properly be devoted to an essay of this character, as well as a scientific pen to exhibit in detail, the action of the starch, gluten and saccharine matter (properties of flour) upon each other, in raising the dough. Carbonic acid gas, formed by the action of the yeast on these properties of the flour, is the air which puffs up or swells out the dough, and forms what is called raised bread. When the dough stands too long, the fermentation destroys the sugar, acts on the starch and produces acid. As long as the fermentation is confined to acting upon the saccharine matter, the other properties of the flour are uninjured; further fermentation must be arrested by the heat that bakes it into bread. If the fermentation acts upon the mucilage and starch, the acid must be neutralized by saleratus or soda. By this process we may have bread free from acidity, but in a short time the bread is apt to become dry and tasteless. If the dough becomes acid, the best and most successful way of adding the alkali is at the time of moulding the dough into loaves, just sufficient to correct the acidity. Much care and judgment are required in applying this, or the bread will be clouded with yellowish spots, or assume a sickly appearance all over. The surest way is to dip the fingers into the solution and thrust them in every part of the dough as it is worked over.

To make good bread, a great deal of pains should be taken, after selecting good flour and sweet yeast, in working up and kneading the dough. It is not enough to stir the ingredients together so as to get through the business as soon as possible; but it must be thoroughly worked together with the hands, that the yeast may penetrate every particle of flour. The second working, previous to putting into pans, should be attended with still greater care; it should be kneaded until perfectly smooth and of a flaky appearance. No more flour than is necessary to keep it from adhering to the board and hands should be used, else the bread will be too hard and dry. Soft water is preferable to make dough. Some persons prefer milk, or milk and water, though with some, the animal taste produced by milk is objectionable.

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The oven should be ready to receive and bake the dough before the second acetous fermentation begins, or the bread will be totally unfit to be eaten. It will be dark, full of holes, sour, hollow in the center and tough and heavy.

When taken from the oven bread should be placed on a dry, clean and unpainted shelf or table, on its edge, one loaf not touching another; if placed in a closet or pantry, there should be no vegetables or cold victuals near, as it readily contracts any unpleasant smell or flavor. It should not be placed in a milk house or cellar until quite cold, as the damp and coolness, acting upon the heat in the bread, have a tendency to make it mould. If it has a hard crust, caused by too great heat, or by remaining too long in the oven, a clean, wet towel should be wrapped around it.

To know how to make good bread, and when to bake and take out of the oven, require close observation, good judgment and long practice. Receipts may be procured from the best bread makers, rules and theories consulted and studied, and still no *good bread* produced. One ounce of good practical knowledge is worth pounds of theories.

The wife and mother of the family, should herself attend particularly to this item in the kitchen department, and if not putting her own hands to the work, must know how to instruct her domestics. The health, happiness and well-being of a family depend more upon the uniform goodness of the bread than upon anything else in the whole domestic economy of the household.

Mothers should see that their daughters early learn how to make good bread, even at the expense of never knowing how to finger the piano or make rich cakes. These can be dispensed with and the temper not soured, nor the good feelings, the harmony and health of the family broken in upon, as in the case of continued use of heavy, sour, ill-baked bread.

In the line of bread making, we have been in a great measure, retrograding these twenty years. We now seldom see the large, white, light loaves that graced the tables of our mothers and grandmothers. *They* were not afflicted with that tormenting and spirit-destroying disease, dyspepsia, neither with neuralgia and all the other tribes of new diseases, that now so unmercifully assail the human family, most produced by bad diet, not the *least* of which is *bad bread.*

One cause of the bread of the present day not comparing with that of a quarter of a century ago, is the scarceness of grist mills in our new States. Farmers, though raising good wheat, cannot have it ground in small quantities, thus having it ever new and sweet. They are obliged to exchange it for flour, or to sell it and purchase flour of which they know nothing. Sometimes it is old and long packed. This never makes *good* bread. Bakers use much of this kind, and with the aid of alum, potash, and other injurious ingredients, make light, white bread, but it is destitute of

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sweetness, and sooner becomes dry and tasteless. Another cause is baking in stoves instead of the fine brick ovens, reflectors or Dutch ovens of other days. Stove heat dries it too much and takes away the fine, natural flavor of the flour. Another cause of failure is trusting almost entirely to domestics, the making of this *most important* part of table luxuries. *They* do not feel for the interest and happiness of the family as the mistress of the house should. We do not trust them with the superintendence or making of our preserves, jellies, marmalades and nice cakes. Then, *why* leave to their judgment and discretion the *greatest* and *best* part of all life's cookery? Our mothers never did so! There lies one secret of the delightful bread of our childhood, the remembrance of which, even now, makes our mouths water, our eyes moisten at associations of the past, and our senses recoil from the appearance of much of the bread placed upon our tables at the present day.

There is too much indifference shown on this subject, too much carelessness and negligence, and as long as this continues, we need not be surprised at often meeting with poor bread. The worst of it is, that many persons are not aware that their bread *is* half sour, so accustomed have they become to eating such. When they meet with delicious sweet bread at other homes, they are in ecstacies over it!—wonder *why* they never can have any like it—compliment it over and over—get directions for the process of making, and there the matter ends. Indolence and proscrastination prevent them attempting any reform in their own miserable mode. Thus a whole life-time passes away without any radical change in the bread-making department of a family.

It is high time for our scientific men, our chemists, and our literary ladies too, to rouse up and *speak out* on this subject. They should give the *theoretical* knowledge they possess to the wives and daughters of our wheat-growing State, that they may *practically* teach it to the coming generation. Mothers should feel it to be a sacred duty to teach this all-important accomplishment to their daughters while under their own immediate care.

In our republican country, where there are so many reverses of fortune, so many vicissitudes in the lives of our women, it is really necessary, for their own comfort and peace of mind, as well as for the happiness of the dear home circle around them, to be perfectly acquainted with *all* household duties. But far above all other knowledge of domestic economy, as the highest and noblest, should be ranked a thorough training in good bread making. In the opinion of the writer, no lady, whatever may be her social position, her education, her accomplishments or literary attainments, is really qualified to become the mistress of a family until she thoroughly understands how to make and bake good, light bread. The "strengthener of our spirits," "the staff of life," the indispensable article of diet on all the tables of high and low, rich and poor, is of too much vital importance to be thought of lightly, or

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totally disregarded, till after marriage. How many hours of anxiety and vexation would be prevented, how many bitter tears would remain unshed, did young ladies become acquainted with such works of utility while underneath the parental roof.

There is a case in my own experience, where an acquaintance of the "whys and wherefores" of the matter would have spared me much vexation and a deal of trouble, but which in the end was productive of great benefit to myself, as it led me to reflect on the subject, and consequently investigate the whole process more deeply than I had ever before done. A young male relative, from one of the Middle States, famed for its good cooks and excellent bakers, paid us a visit of a few weeks. At the same time, a matronly cousin, from another State, (herself one of the best of bakers,) with her daughter and aunt, were also our guests. Priding myself upon having all our culinary arrangements of the *first order*, and above all, trying to have the *best* of bread, I signally failed in my first attempt! Chagrined and mortified beyond expression, vexed at myself and everything about me, I determined this *never should occur again;* and with the best grace possible, made the most of a bad failure. Living miles from a bakery, I had no resource, only to throw the whole batch away, which economy forbade, or make it into toast or batter-cakes, adding saleratus to the milk to destroy the acidity of the bread. The latter method was adopted. With renewed assiduity and buoyant expectations, I tried my skill on another tray-full of flour, which certainly would make ample amends for all the poorness of the last. It was made and attended just as all my hitherto good bread had been. It rose but partially. In the moulding out it was kneaded with extra care, and made into smooth, beautiful loaves. During the raising, it was faithfully attended, turned, kept warm, and watched with all the solicitude of a mother over an ailing child, for was not my reputation as a good baker at stake? Had we not two superior judges sitting at our table three times each day? Could I sit down or rise up from table with a pleasant countenance when such an unsightly object as a dish of bad bread stared me in the face as it did the day previous? No! I could not endure it. This bread *shall* be good! Soon, instead of rising up quickly, the dough began to grow thinner and spread out until flat and even with the top of the pan. As a necessity, to prevent it running over, I put it to bake, my highly wrought expectations all taking their flight. The result of such looking dough was coarse, dark brown! More mortified than ever

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Now, of all other times of my life, when such competent judges were testing my ability and experience in the housekeeping line, I could never again hold up my head among good bread makers. I would hide myself in some corner when the subject was discussed, and would give up all pretensions to success in that common part of housekeeping. I could have cried from pure vexation, had I not deemed it sinful. Resolution and perseverance, however, came to my relief, and suggested "try again." Just then, when my heart was really more troubled than ever before on a similar occasion, a happy thought occurred to me: "Change the yeast!" Ah, that's it! Early in the morning a child was despatched to a neighbor, and procured some new, light yeast. The flour was warmed and sifted, another effort was made, and lo! light, white, sweet bread was made from that same barrel of flour! The new yeast contained some properties which my old yeast had lost by long keeping, dampness and other causes which I did not understand. Never did I feel more truly thankful for a like comfort, nor rejoice more over a baking of bread than I did over that one. The irritability that I felt every time the poor bread came in my sight, with the attendant grumbling at the badness of the flour, were all done with. I really felt happy, and like a new person. Of course, as a natural consequence, the whole family had, more or less, partaken of all these bad feelings for some days, for who can feel well or pleasant when they make, see, or have occasion to eat poor bread? Now, all was hilarity and good humor. Witty sayings, rich anecdotes, complimentary remarks and sage suggestions, poured forth in copious effusions during our social repast—all produced by having good, eatable bread.

Thus we may, by a little reflection, analyzing and moralizing, trace out the intimate connection between good bread and the comfort, well-being and happiness of a whole family.

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MISCELLANEOUS ESSAYS.

FAMILIAR LETTERS ON GEOLOGY.

By A. H. Worthen, State Geologist of Illinois.

In the series of letters which we propose writing on this branch of natural history, we shall refrain as far as possible from the use of technicalities, and confine our discussions mainly to the geological features of our own State.

The term *geology* is used to designate that branch of natural science which treats upon the internal structure of the earth; and, like the science of comparative anatomy in its application to the animal economy, it takes up in succession the various strata which compose the solid frame-work of the globe which we inhabit, analyzes their chemical constituents, and illustrates the varied conditions under which they have been elaborated, and the economical uses to which they may be applied.

The term *rock*, as used by geologists, signifies any mineral substance which enters into the structure of the earth, and is applicable not only to the solid portions, such as lime-stone, granite, etc., but is also applied to the softer materials, as clay, sand and gravel, which have been derived from the decomposition of the more solid masses.

The rocks composing the earth's surface are divided into two grand divisions, termed "stratified" and "unstratified" rocks. The stratified rocks comprise all those which are formed in regular beds or layers, as are nearly all our lime-stones, sand-stones, slates, etc., and have resulted from the slow accumulation of sediment beneath the bed of the ocean. The unstratified rocks include the granites, porphyries, amygdaloids, etc., which seem to have been formed, in whole or in part, by the cooling of melted mineral matter. All the rocks of our own State, except a portion of the material forming the drift deposits, belong to the first of the above-named grand divisions.

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The stratified rocks are again subdivided into groups called *formations*, and these are distinguished from one another mainly by the organic remains or fossils that are found embedded in them. As they were formed, as we have already observed, by the gradual accumulation of sedimentary material beneath the ocean's level, they would naturally contain the remains of such animals as existed in the ocean or upon the adjacent land during the period of their accumulation; and thus every geological formation contains, in its fossilized remains, the representatives of a distinct creation of organic life, so complete that it is rare to find even a single species among many hundreds that pass from one formation into another. Thus, through the successive developments of organic life, the geologist is enabled to trace the true order of succession in the geological formations, and to identify at a glance the equivalency of strata, out-cropping in regions widely remote from one another.

The direct bearing of geology upon the great interests of agriculture will be readily perceived, when we realize that the soil is derived directly from the underlying rock strata, and consequently is modified, to some extent, at least, by every change which may occur in the character of the subordinate beds.

Will the reader go with me into the great laboratory of nature, and observe the beautiful process by which the soil is formed? Yonder is a huge mass of rock—lime-stone, if you please—which has tumbled down from the cliffs above, and now lies in a nearly horizontal position a hundred feet below its native bed. At first it presented only a surface of naked rock, entirely unfitted to sustain vegetable life, but the action of the atmosphere upon its surface for a few years has disintegrated the mineral constituents of which it was composed, and formed a thin coating of decomposed mineral matter. This thin layer of comminuted material sustains a few lichens and other minute plants, and they, by their growth and decomposition, add the vegetable to the already accumulated mineral material. This growth of vegetation affords protection and support to insects, which deposit their larvæ and feed upon the fibers of the minute plants. The insects attract the birds and larger animals that feed upon them, and their exuviæ is added to the mass, and thus we have the constituent materials of our best soils, as the result of the combined action of the three great kingdoms of nature—the mineral, the vegetable and the animal. This process is always the same, whether it commences on the surface of the hard lime-stone rock, or under more favorable conditions upon a surface of already comminuted mineral material, and goes steadily on, year after year, until there is a sufficient accumulation of soil to sustain the more robust forms of vegetation, and finally a growth of forest trees covers what was once but a naked rock surface.

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And let us always bear in mind, that *to-day* is just as potent in all the grand results of creative energy as any day that has preceded it in the countless ages of the past, and that the same *eternal laws of creative development* are constantly in active operation, working out the grand results for which they were instituted by the Eternal Mind.

A soil composed of a single element, as clay, sand or lime, would necessarily be an unproductive one, and if it were formed by the decomposition of a single rock, the same result would follow, unless the rock contained several of the mineral ingredients essential to the sustenance and growth of vegetable life. Hence, we find that on passing from one geological formation to another of a very different character, a corresponding change takes place in the soil and vegetation, and this is often so well marked that the boundaries of the different formations may be almost as accurately defined by observing the changes in the character of the vegetation upon the surface, as by the examination of the rock strata beneath.

The soil over at least three-quarters of the whole area of this State has been derived from and is predicated upon a single geological formation, termed *drift*. This consists of beds of clay, sand and gravel, with water-worn rocks called *boulders*, and the whole has resulted from the breaking up and mingling together of all the different varieties of the rocks of the adjacent region, as well as those from distant localities, and the whole mass has been drifted by the combined action of ice and water to the various localities where this deposit is now found. Hence, it contains fragments, not only of the adjacent rocks, but also of the granites, sienites and porphyries of the primary formations at the far north, which have been wrenched from their native beds by the resistless power of the iceberg and glacier, and sent crashing and grinding along on their southward journey, with a force that has completely obliterated all their angles, and given to the hardest fragments the rounded contour which everywhere characterize the *boulders* of the drift.

We may readily perceive, in the dynamic laws which have resulted in the accumulation of the drift deposits, the proper conditions for the production of a soil which contains within itself an inexhaustible supply of all the necessary mineral ingredients for

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present races of animals upon the earth, as is proven by the occurrence of their remains embedded by natural causes in these deposits.

If we extend our examinations southward beyond the confines of the drift, which terminates in a southerly direction near the 38th parallel of north latitude, we shall find that, instead of the uniform character which is so marked a feature or the central and northern portion of the State, the soil is subject to abrupt local changes in its appearance and productive qualities, resulting from the changes which take place in the character of the underlying strata from which it is derived. If the underlying rock is a sandstone, the soil will generally be sandy and poor, but if an impure limestone forms the substratum, containing the proper portions of magnesia, alumina, etc., the soil would perhaps equal in its productive qualities that derived from the drift under the most favorable conditions.

It was the good fortune of the writer to spend the winter of 1855–6 in exploring the geological characters of the extreme southern portion of the United States, the land into which the extension of *Northern* institutions is interdicted—even to the exclusion of *northern drift*—and I was thus enabled to observe, under very favorable circumstances, the marked changes which occur in the soil and vegetation, in passing abruptly from one geological formation to another of quite a different character. A single instance will serve as an illustration.

Starting from Tuscaloosa, in Alabama, and proceeding north towards the Tennessee river, we travel for nearly a hundred miles upon the shales and sandstones of the Coal Measures. The country is broken and hilly, owing to the soft and yielding character of the strata; the meagre forests consist mainly of pitch pine and scrub oaks; the settlements are sparse, and the inhabitants who cultivate their little patches of corn and sweet potatoes among the hills are known by the expressive appellation of *poor whites*. Anon, we reach the limestones of the sub-carboniferous series, and at once the pitch pines and scrubby oaks give place to magnificent forests of oak, ash, elm and cedar, which crown the summits and skirt the flanks of the hills, while the broad valleys are covered with fields of cotton, and are dotted with the showy mansions of the wealthy planters who live in ease and luxury upon the labor of their *black chattels*.

The change in the vegetation and agricultural capacities of the country above noted is not a gradual one, but a distinct and well defined line, which would enable the observer to determine correctly the outlines of the geological formations, to which alone the changes in the character of the vegetation is to be attributed.

Hence we say—and numberless facts could be cited to justify the assertion—that the avocations, the wealth, and the physical and moral conditions of a people are determined, to a very con-

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siderable extent, at least, by the peculiar geological character of the country which they occupy.

The geological structure of New England compels the inhabitants of that region to rely mainly on commerce and manufactures for a subsistence, and the same cause has peopled the broad prairies of the Northwest with a population devoted mainly to agriculture. It compels the inhabitants of the sandy plains of the Carolinas to resort to the production of tar and turpentine, from the pine forests of that barren region for a precarious subsistence, and enables the cotton and sugar planters of the Southwest to grow rich on the unpaid labor of the slave. Thus we find all the different departments of industry resting upon the same common foundation, and all dependent upon the nature of the geological sub-strata from which the soil has been derived.

We have treated the *Quaternary system* mainly in its relation to the soil, and it remains now to speak more particularly of its mineral characters, and the economical materials which it affords.

We have already said that it was composed of three divisions, which are called *Alluvium*, *Loess* and *Drift*. The alluvium forms the river "bottoms," and is the last formed, or most recent of the three divisions, and the sands and clays of which it is composed have been derived from the adjacent highlands, and have been carried down to the lower level which they now occupy by the aqueous agencies now in operation upon the surface. The largest tract of alluvium in this State is comprised in what is known as the "American Bottom," which extends from Alton to the mouth of the Okaw or Kaskaskia river, with an average width of four or five miles.

The term loess is applied to a deposit which forms the upper portion of the river bluffs on all the principal streams in the State; and hence, has been sometimes called the "bluff" deposit. It varies in thickness from one to fifty feet, or perhaps even more at some localities, and is composed of marly sand and clay, usually of an ashen, gray or buff color, and has undoubtedly been formed by sedimentary accumulation in lakes, or other large bodies of fresh water. This is clearly proven by the fact that the entire mass is often filled even to the depth of fifty or sixty feet with fresh water or land shells, such as now inhabit the adjacent region. The sediment in which these shells are now embedded must have been deposited in quiet waters, otherwise they would have been ground to powder, and all trace of their existence obliterated by the action of contending currents.

The loess is found in nearly all of the counties bordering upon the Mississippi and Illinois rivers, and the soil derived from it is admirably adapted to the growth of fruit. It also forms some of the best wheat lands in the State.

These deposits, with the underlying drift, furnish the sands and clays for brick so extensively used throughout the State, and are

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also the source from which our wells are supplied with unfailing streams of water. The superfluous water which falls upon the surface is absorbed by the porous beds, and penetrates downward until it meets an impervious stratum, and there forms subterranean streams or reservoirs for the supply of man.

From the very nature of these deposits, and the conditions under which they have been accumulated, no beds of mineral ores of any kind could reasonably be expected to occur in them, and yet it is by no means uncommon to find the most extravagant expectations of mineral wealth predicated upon fragments of coal, lead, or native copper and gold, which are sometimes found in the drift material. The copper and gold have been derived from the talcose slates and primordial beds of the Lake Superior region, while the galena and the coal have come from the silurian limestones and coal measures of our own State, and have been transported from their native beds by the same agencies that have accumulated the boulders of granite and other primitive rocks with which they are associated. Large trees, as well as smaller fragments of wood, are frequently found in the drift at a considerable depth below the surface, and this is looked upon as an extraordinary and wonderful phenomenon by those who never take the trouble to investigate the causes of the natural results which they see around them.

The popular ignorance prevailing throughout our land in relation to the elementary principles of Natural History, in all its branches, is truly lamentable, and is, by no means, confined to those who have unfortunately failed to receive the common advantages of our educational systems, but is quite as observable among those who claim to have been educated in our high schools and colleges. It is to be hoped that the time is not distant when our present educational system will be thoroughly remodeled, so that an introduction into the elements of Natural History will be considered as an indispensable part of every child's education. To this end our graded schools (which should be, in every respect, the best schools in the State,) should be provided with cabinets in Natural History, containing specimens, correctly labelled and arranged, of all the different orders and genera of plants, birds, insects, etc., which abound in the adjacent region, as well as the common minerals and fossils of our own and the neighboring States. This could, in part, be accomplished by the children themselves, under competent teachers, during the periods of vacation. If the necessary expense attending the introduction of such a system of instruction into our common schools should be urged as an objection against it, allow me to suggest that if the parents will abstain for one year from the use of whisky and tobacco, and devote to this object the money thus saved, it will purchase such a cabinet for every graded school in the State.

The establishment of the Normal University at Bloomington, for the especial purpose of educating teachers for our common

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schools, is a step in the right direction, and the attention given in that institution to the several departments of Natural History promises most favorable results to the educational interests of the State, and if it can be kept free from the baleful influences which have tended to cripple and paralyze the collegiate institutions throughout our land, we may hope that great and lasting benefits, in the way of radical educational reforms, may result to the rising generation from the establishment of this institution.

But to return from this digression to the discussion of the drift phenomena. Although the drift deposits in some parts of Europe seem to have accumulated beneath the bed of the ocean, as is attested by the fragment of marine shells which are found imbedded in them, yet, in the examination of similar deposits in the Valley of the Mississippi, we have failed to discover any evidence that they are of marine origin, while we have conclusive evidence that a large portion of this State has been submerged beneath large bodies of fresh water since the creation of the present races of animals, as is proven, as already observed, by the occurrence of marly clay filled to the depth of from ten to fifty feet with fresh water and land shells. This deposit not only caps our river bluffs, but has been penetrated at several localities in Sangamon county, and it seems quite probable that the great fresh water basin of the northwest was so extended, at a comparatively recent period, so as to comprise a large portion of this and the adjoining States.

In contemplating the striking and varied physical changes which have taken place upon the earth's surface during a single geological period, it will be well to bear in mind that these changes, wonderful as they may seem to us, have all been effected by causes that are still in operation, and are only the natural results of laws which are as eternal and unchangeable as the *Divine Mind*, in whose wise councils they were originated.

Before leaving entirely the discussion of the quarternary deposits, we propose to allude briefly to some facts connected with the fossil remains found embedded therein, which have an important bearing on the science of geology itself, as well as upon the history of the human race, and the natural relation of man to the earth which he inhabits.

Down to a very recent period, or within the last decade of years, the creation of the human race has been generally conceded, by American geologists, to have been an event of comparatively recent occurrence, and one that might have taken place within the last six or seven thousand years.

But this conclusion has now been proved to be entirely without

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country, and we have obtained, within the last three years, incontestible evidence within the limits of our own State of the existence of man on this continent before the accumulation of the drift material, and cotemporary with the huge mammalia, of extinct species, whose bones are now found only in a fossil state. The following facts may be cited as evidence in proof of this position:

In sinking a well near the town of Kappa, in Woodford county, in this State, in the summer or autumn of 1859, a small slab of sand-stone was taken out of undisturbed drift gravel, at a depth of nearly thirty feet below the surface, bearing unmistakable evidence of human workmanship in the rude hieroglyphics which were inscribed upon the surface of the stone. This stone is now in the possession of the writer, and may be seen by any one who is interested in investigations of this kind. Stone axes and flint arrowheads are also frequently found in beds of unaltered drift, where they could only have been deposited by natural causes. These are only a few of the facts which might be cited in proof of these views, but to us they seem entirely conclusive, inasmuch as they are confirmatory of what is regarded as a well-established fact on the other side of the Atlantic.

The bones of the mammoth, the mastodon, and other extinct mammalia of this period, though sometimes found in the drift gravel, are most commonly met with in the loess and alluvial clays which form the upper part of the quaternary system, showing that these animals did not become extinct until a comparatively recent period, and long after the appearance of man upon the earth.

Several species of animals are known to have become extinct since the historic period, among which are the great "Irish elk," whose bones are found embedded in the peat bogs of Ireland, along with the stone axes and canoes of the savage islanders. The "dodo," a huge wingless bird, was found by the early navigators inhabiting the island of Mauritius, and living specimens obtained; but none have been found alive for the last two centuries, and the species is regarded by naturalists as now extinct.

These facts only show the existence, at the present time, of the same general laws of creation, development and extinction which have characterized the vast geologic periods which have preceded the one now under discussion, and which, beginning with the lowest and simplest forms of organic life in the dim vista of the Taconic and Silurian periods, has culminated in the creation of man, as the highest form of the animal kingdom, and the one fitted to contain that spark of the "*Divine Being*," the *immortal spirit*. These changes have not resulted from any violent convulsions of nature, as has sometimes been supposed, but are rather the natural out-growth of the same eternal, immutable and unchanging laws which pervade all nature, and through which all the grand results of creation have been accomplished.

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The length of time consumed in the accumulation of the quaternary deposits must have been immense. Those of my readers who have read the very interesting paper of Prof. Agassiz, published in the June number of the *Atlantic Monthly*, on the growth and formation of the coral reefs on the coast of Florida, will remember that he clearly proves that the living species of corals that have formed these reefs must have been at work at least *seventy thousand years* in building up from the ocean's bed the series of reefs which now surround the eastern shore of this peninsula; and this is probably only a moiety of the time that has elapsed since the present species of marine animals began their existence.

We are fully aware of the fact that these views are in direct conflict with the Jewish cosmogony, which is generally accepted as a truthful history of the creation of man, and the lower order of animals with which he is associated; nevertheless, we are forced to accept the evidence of nature, as revealed in her works, as paramount to any human testimony or written record, however high its claims may be to our consideration.

The *Book of Nature* is the grandest and most sublime record of the history of our globe, of which it is possible for the human mind to conceive, and one which the *Divine Being* undoubtedly designed for man's especial study and instruction; and hence its great truths are left to the possession and enjoyment of those who, through patient investigation and by diligent labor, search for and obtain the rich treasures of knowledge that are unfolded from its pages. Would that I could fully impress the minds of my readers with the importance of this study, not only as an essential element to our happiness here, but as furnishing one of the abiding treasures which we may carry with us into the *great hereafter*. In the language of a gifted poet, we may truly say that the study of nature's works

> "Can so inform
> The mind that is within us, so impress
> With quietness and beauty, and so feed
> With lofty thoughts, that neither evil tongues,
> Rash judgments, nor the sneers of selfish men,
> Nor greetings where no kindness is, nor all
> The dreary intercourse of common life,
> Can e'er prevail against us, or disturb
> Our cheerful faith, that all which we behold
> Is full of blessings."

If we strip off the superficial covering of quarternary deposits which now cover almost the entire area of the State, we come directly upon the *stratified rocks*. These are usually found exposed in the bluffs of the streams, or in any other localities where the superincumbent mass has been removed by natural or artificial causes.

As we have already said, the term "*stratified rocks*" is applied to all such as are found in regular beds or layers, as lime-stones,

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shales, slates, etc. These have all been formed beneath the water level, either by sedimentary accumulation or chemical deposition; and so long as a certain region was constantly submerged, these formations would accumulate in regular succession, one above another, like the concentric coats of an onion. But there is no part of the earth's surface at present known which has been always submerged, and constant changes of level seem to have taken place between the land and water during the early geological periods, as is known to have been the case since man became capable of noting and recording the various changes which occur in the physical world around him. Through these changes in the relative position of the land and water, the geologist is enabled to examine beds of rock fully exposed at the surface, which otherwise would be covered by many thousand feet of overlying strata, and the whole geological series of stratified rocks, embracing a thickness of more than ten miles, with all their vast treasures of mineral wealth, are thus made accessible for the use of man.

The following comparative section will give the reader a correct idea of the geological systems to be found in Illinois, and their relation to the entire series of stratified rocks:

Complete Section of Stratified Rocks.	*Section of the Illinois Rocks.*
Tertiary,	Tertiary,
Cretaceous,	
Oolitic,	
Triassic,	
Permian,	
Carboniferous,	Carboniferous,
Devonian,	Devonian,
Upper Silurian,	Upper Silurian,
Lower Silurian,	Lower Silurian.
Taconic.	

From a glance at this section, it will be seen that, of the ten systems into which the stratified rocks are divided, five are represented in Illinois.

The Tertiary system, which comes first in the descending order, is at present only known to exist in the extreme southern portion of the State, covering the high lands in Alexander and Pulaski counties, and probably a limited area in some of the counties adjoining. Its greatest development appears to be in Pulaski county, where it attains a thickness of at least one hundred and fifty feet. It is composed of regularly stratified beds of clay, sand and marl, the latter bearing a close resemblance to the celebrated "*green sand*" of New Jersey.

The fossils which characterize the tertiary beds of Southern Illinois are not numerous in species, and the marine shells are usually found in the condition of casts, the shell itself having been dissolved by the acids which permeate the mass. Fossil wood is quite abundant, and in a fine state of preservation—the woody fibre being entirely replaced by silica, rendering the specimens as

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hard and indestructible as flint. These fragments of wood are found of various sizes, from an ounce to more than a hundred pounds weight. These were probably carried into the Tertiary ocean by the action of rivers, as trees are now carried into the ocean by the same causes, and, after becoming saturated with salt water, sank to the bottom, where they were embedded in the sediment which composes the rocks in which they are now found.

Although by far the greater number of the species of shells now found in the Tertiary beds no longer exist in a living state, yet there are a few found in the upper division of this system that are undoubtedly identical with species still living on our coasts, and these form the connecting link between the past and present creations of animal life. This continuity of a few species from one geological formation to another appears to obtain through all the fossiliferous stratified rocks, and seems to prove conclusively that the disappearance of the old and the appearance of the new creations of animal life was not attended with any sudden and violent convulsion of nature, as has sometimes been asserted, but, on the contrary, was a gradual and quiet change, such as still characterizes the grand efforts of nature in her unfoldment in accordance with the laws of eternal progress.

The only materials of economical value yet discovered in the Tertiary beds of Southern Illinois are potter's clay, marl and iron ore; the latter occurs as a brown hematite ore, and has probably been derived from the ferruginous sand-stones and cherts of the carboniferous series. The iron ores of Hardin county are similar in character, and many have been derived from the same source. A heavy bed of conglomerate, in which the cementing material is an oxide of iron, is a conspicuous member of the Tertiary series, and caps some of the hills in Union county, from which they have received the name of "*Iron Mountains*." This is, however, entirely a misnomer, as there is no similarity whatever between this deposit and that to which the same name has been applied in Missouri.

During the Tertiary period, the ocean covered the greater portion of the States of Louisiana and Mississippi, with portions of Alabama, Tennessee and Arkansas, and extended up the present valley of the Mississippi far enough to include the extreme southern

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horse, the camel and the elephant, were very closely allied to those living at the present time.

When we pass the Tertiary system we find a wide hiatus in the Illinois rocks when compared with localities where the series is complete, embracing four entire systems, which, when fully developed, include a thickness of several thousand feet. These systems of rocks are known to geologists as the Cretaceous, Oolitic, Triassic and Permian systems. These are all represented on the Island of Great Britain in their regular order of sequence, while at least two of them, the Cretaceous and the Oolitic, are represented in different localities on this continent. Their absence in any given locality might be ascribed to either one of two causes, either the elevation of the surface of that particular region above the ocean level during the period that these rocks were in process of deposition, or their subsequent removal by denuding agencies operating upon the surface. The great thickness of the strata wanting to complete the series in Illinois, renders the latter hypothesis quite improbable, and we are led to conclude that immediately after the deposit of the carboniferous system the whole surface of the State was elevated above the ocean level, and so remained for the countless ages, during which the missing systems were in process of formation. The carboniferous system, which comes next in the descending order in the Illinois section, is usually subdivided into three groups, termed respectively coal measures, millstone grit and mountain limestone. In the southern part of the State these groups are well represented, but towards the north the two lower divisions thin out and entirely disappear, so that along the northern borders of the Illinois coal-field the coal measures, or upper divisions of the system, rest upon devonian or silurian strata. The term coal measures is applied to that portion of the system which contains the principal coal seams. They consist of a series of sandstones, shales, stratified clays and coal, with some thin beds of impure limestone, the whole of which attain a thickness of five or six hundred feet in Central and Northern Illinois, and probably a thousand feet or more in the extreme southern portion of the State, where the Illinois coal-field is joined to that of Indiana and Kentucky. These beds are all of sedimentary origin, except the coal itself, and the limestones and calcareous shales are generally filled with marine shells, corals and the remains of fishes, while in the sandstones and clay shales the remains of land plants are most abundant, and may be obtained in some localities in a most perfect state of preservation. More than one hundred species of plants have been discovered within the limits of the State during the progress of the geological survey, many of which were of new species never before seen, and these have been figured and described to illustrate the geological report now ready for publication. The number of coal seams afforded by the coal measures of Illinois is from ten to twelve, about one-half of which are of workable thickness, while

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the others are thin, varying from eighteen inches in thickness to a mere streak of coaly matter.

The *modus operandi* by which the coal has been formed is a subject which has elicited considerable discussion among men of science, but it is now generally conceded to have resulted from the accumulation and subsequent carbonizing of vast deposits of vegetable material by the action of chemical forces acting upon the vegetable material under great pressure, and when submerged beneath the ocean or some other large body of water. To illustrate the origin of the vegetable matter which is necessary to the formation of the coal, we may consider a *peat bog* as a coal seam in embryo, and suppose that if the vegetable matter which forms the peat should be submerged for a long period beneath the ocean the result would be a seam of bituminous coal. If we accept this hypothesis as the true explanation of the conditions under which the coal seams have been formed, we must suppose that the area over which the coal seams now extends was once a low swampy marsh, elevated, it may be, only a few feet above the ocean level, and there the luxuriant vegetation necessary to the formation of a seam of coal once flourished, just as the vegetable material necessary to form the peat now accumulates, and that this was gradually submerged beneath the ocean's level, where the chemical changes took place which were necessary for the conversion of the vegetable material into coal. The period of submergence was sufficient for the accumulation of whatever sedimentary strata now intervene between the coal seams, and then a gradual elevation partially drained the water from the surface, and then another growth of vegetable material was prepared for the formation of another seam of coal. This process of subsidence and elevation must have been repeated as often as we have successive seams of coal one above another. If we would undertake to realize, to some extent, the vast period of time which has been consumed in the formation of the coal measures we must take into account the accumulation of the many hundred feet of sedimentary strata, with which the coal seams are connected, as well as the immense amount of vegetable matter necessary to the formation of the coal itself.

"*Anthracite coal*" is a bituminous coal, from which the bituminous and other volatile properties have been expelled by chemical action or by contact with metamorphic strata. "*Cannel coal*" is an earthy textured bituminous coal, highly charged with oily matter, and is believed to have been formed mainly of resinous wood. A coal seam often affords bituminous coal at one point and cannel coal at another, or sometimes one part of the seam will af-

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the sedimentary material in which they were finally embedded was accumulated around them. If any one is disposed to question the vegetable origin of the coal let him take a piece of common bituminous coal and split it along the planes of deposition and he will find thin layers of charcoal, in which the woody fibre is still plainly visible, alternating with the harder and more compact layers of the coal. In addition to the coal, which is the main product in an economical point of view, afforded by the coal measures, they also yield good beds of "fire clay," "potter's clay" and iron ore. The best fire clays are usually found immediately beneath the coal, forming what is usually termed the under clay to the coal seam, and probably represents the soil upon which the ancient vegetation forming the coal once grew. Sometimes the roof of the coal is also formed of clay-shale, but more commonly it is a bituminous shale or limestone, which forms a good roof to the coal seam. The iron ores connected with the coal measures are usually the oxides or carbonates of iron, and have been deposited from the aqueous solutions of that mineral. They occur either in regular beds or in nodular concretions disseminated through the shales and sandstones with which they are associated. Good building stone is also obtained from the limestones of the coal measures. The State House is built of a limestone belonging to this formation, and is really a very excellent building stone. The bed from which it was obtained varies in thickness from ten to twenty feet. It outcrops at intervals along Sugar Creek, from the south line of the county, near Virden, to Crow's Mill, six miles south of Springfield. The city of LaSalle is built upon and in part from the same bed of limestone. Some of the sandstones of the coal measures furnish a freestone of excellent quality, but great care is necessary in their selection, as some beds crumble rapidly on exposure to atmospheric influences, while others harden on exposure and form an excellent and durable building stone.

In the present number we propose to digress somewhat from the regular order we have been following in our previous communications, for the purpose of giving some facts in relation to the *lead deposits* of the Northwest, and some general remarks upon the rocks, in which the mineral wealth of that highly favored portion of our State is found. We had the pleasure of spending some weeks, during the past summer, in company with Capt. E. H. Beebe, a practical miner and amateur geologist, in exploring the lead region of Galena and the adjacent country, carrying our observations northward to the Pottsdam or Taconic Rocks of Wisconsin and Minnesota, and the out crops of Trap Rocks at the Falls

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fied rocks in almost every other portion of the State, and the consequent frequent out-cropping of the limestones upon the surface, giving a somewhat wild and rugged aspect to the general surface, while deep valleys have been excavated in the limestones by the prevailing currents of water, leaving precipitous hills which, in some instances, have an elevation of four or five hundred feet above the beds of the principal streams. To one accustomed to the monotonous scenery of a flat prairie region, the contrast presented by the precipitous bluffs of the Galena limestone, and the green and undulating slopes of the Hudson river Shales, forms a landscape of rare beauty. The limestone escarpements are often weathered into fantastic imitations of castellated walls and ruined towers, while the intervening valleys, with cultivated fields and tasteful cottages, refresh the eye of the traveler with most pleasing scenes of rural beauty. In the absence of the drift deposits the soil has been derived directly from the subordinate beds of limestone and argillaceous shale, and although not as deep as the soil of the flat prairie regions, is nevertheless exceedingly fertile, producing in abundance all the cereals adapted to the climate. The popular axiom, that "a rich mineral region has a barren soil," does not hold good in this case, for abundant crops are obtained throughout the lead region wherever the land is brought under cultivation. The lead bearing rock of the Northwest has been very properly named "*Galena Limestone.*" It belongs to the Lower Silurian series, and its relation to the other members of the group, as they appear in the Northwest, may be understood by the following section:

Rocks of the Lower Silurian Series,	**Hudson River Shales,** ***Galena Limestone,*** **Trenton or Blue Limestone,** **St. Peter's Sandstone,** **Calciferous Sandstone.**

It undoubtedly belongs to the upper part of the Trenton Limestone of the New York Reports, though in that State, or indeed at many other localities in the Mississippi Valley, it shows no evidence of being a mineral bearing rock. It may be described as a regularly bedded, buff or brown colored magnesian limestone, in-

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quently do. Large quantities of ore are also found imbedded in the decomposed limestone, which, in the form of a brown clay, partially fills these caverns. The lead ore called "galena" is formed by the combination of lead with sulphuric acid, in proportion of about 85 of lead to 15 of sulphur, and the ores associated with it are the sulphurets of zinc, iron and copper, and the carbonate of zinc or "*dry bone*," as it is termed by the miners. At some localities several of these minerals are found associated together. One of the most remarkable deposits of this kind ever found in the lead region is that known as "*Marsden's Lead*," about four miles southeast of Galena. At this locality the lead, zinc and iron form stalactites, some of which are two or three feet in length, with a diameter of four or five inches. A beautiful fibrous lead forms the centre of the stalactite, over which the zinc ore is deposited, and this is covered with a layer of sulphuret of iron in beautiful crystals. Sometimes the surface of the stalactite will be thickly studded with crystals of galena in cubes, which are also coated with crystalized sulphuret of iron. These minerals are combined in almost every conceivable variety of form at this locality, and it has afforded the finest series of cabinet specimens ever found in the lead region.

The carbonate of zinc or "*dry bone*," is found in great abundance in the vicinity of Mineral Point, and a furnace has been erected at LaSalle for smelting zinc from this ore. The "galena" found with the zinc at Mineral Point is sufficient to pay the expense of mining, and the zinc ore can be delivered at LaSalle for the cost merely of transportation by rail, and the enterprise bids fair now to prove a final success.

Perhaps no better idea of the vast wealth sometimes hidden in the caverns of the Galena limestone can be given to the reader, than to quote the eloquent description of Levins' Cave, near Dubuque, as given by Mr. Charles Whittlesey, who visited it in 1850, soon after it was discovered by the fortunate proprietor. The outcrop of this crevice was on the side of a hill, and was so narrow for some distance after entering the hill as to admit the passage of a man with considerable difficulty. After speaking of the difficulty of squeezing between the walls of the narrow, winding passage, he goes on to say:

"We had not gone far in this uncomfortable manner, when a handsome cave appeared before us, illuminated by the lights in front. It was a square room, with a mud floor and a rock ceiling, along the middle of which was a seam or vertical crevice, containing galena. This crevice was about two feet broad, the sides covered with mineral six or eight inches thick, leaving a space between the inner faces of the mineral, up which we could see several feet. There was about this crevice an entirely new feature, so far as I know. The solid mineral projected from this crevice downward a foot to a foot and a half in a 'sheet,' as they call it, eight to ten

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inches thick, and twenty-five to thirty feet long, spreading fan-like as it descended. A part of the way there were three sheets, two thick and heavy ones, with coarse, irregular surfaces, composed of aggregated cubes from two inches to ten inches on a side, and one thin or light sheet, the whole covered with carbonate of lead, and having, in consequence, a pure white color. This depending mass was wholly clear, except where it was attached to the rock above and projected downward in space, the most rich and beautiful object I ever saw of a mineral kind. About two hundred feet more of twisting and squirming brought us to the leaden temple, where lay the fortune of our bold explorer. It is a cave, or 'pocket,' some hundred and thirty feet long, twenty feet high in the dome or cavern part, and twenty to thirty feet wide, the sides and roof arched in an irregular manner. Probably it extends in this oval shape to a depth equal to the clear space above. The whole appears to have been ceiled with lead; and although its size is not as great as that of many other mineral caves, the amount of galena in view at any one time is said to exceed that of any 'pocket' yet opened. Much of the lead lining the roof and sides had fallen down in immense blocks, some of them very recently. This mineral incrustation was in some places two feet thick, and one of the fallen masses was estimated to weigh twenty-three thousand pounds."

Such was the appearance of this wonderful cave when discovered, and subsequently it has yielded about four million pounds of mineral, worth, at the current rate of lead, about one hundred thousand dollars.

Although the Galena limestone out-crops over a large extent of area in Northern Illinois, it has produced no productive lead mines beyond a radius of about 40 miles from Galena, and the lead mining is restricted mainly to the counties of JoDaviess and Stephenson. In ascending the Mississippi, the lower beds of the series come successively to the surface, and no out-crops of the lead-bearing rock is seen north of the Wisconsin river.

We propose now to say something in regard to the conditions under which the metals of the Galena lime-stone have been deposited, and the probable causes which have produced their deposition in such forms as to make them available for the use of man.

All the metals, except gold, are found combined with some other substance, as sulphur, carbon, oxygen or phosphorus, forming what are called "ores" of these metals, and the ores are subjected to the process of *smelting*, before the metals which they contain can be made to subserve the various economical uses to which they are adapted. The process of smelting is performed by subjecting the ore, and some other mineral substance to act as a flux, to the action of a strong heat, by which the metal is separated from the substance with which it was originally combined in the ore, and is left in a comparatively pure state.

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Gold is not found in chemical combination with any of the earthy minerals above named, but is sometimes met with associated with *native silver*, forming what is sometimes called a "gold ore;" but usually it is found as a native metal, and free from all foreign admixtures. Silver and copper are also sometimes found in the condition of *native metals;* but more commonly they exist as ores in combination with some other substance. A few specimens of *native iron* have also been found; but so exceedingly rare are they, that they readily sell for their weight in gold for cabinet specimens.

Lead, zinc, copper and iron are the only metals that are found in any considerable quantities in the lead-bearing rocks of the north-west. The lead occurs in that form of ore known as *galena*, or the sulphuret of lead, which is a combination of lead and sulphuric acid, in the proportion of about 85 per cent. of lead to 15 per cent. of sulphur. Silver in small quantities is frequently found in Galena, and if present in any considerable quantity, the ore is called *argentiferous galena*. The ores from the north-west afford but a mere trace of silver, while those from Rosiclare, in Hardin county, afford from eight to ten ounces of silver to the ton of ore.

The most common zinc ore found in the Galena lime-stone is the sulphuret of zinc, or "*black jack*," which resembles lead ore somewhat in its color, and is often mistaken for it by those who have no knowledge of mineralogy; but it is harder and lighter than galena, and is usually darker colored, and tinged with brown or an amber yellow. The carbonate of zinc, or "*dry bone*," as it is called by the miners, also occurs in considerable abundance in this region, and has probably been formed by the decomposition of the sulphuret, as is proved by the frequent occurrence of specimens in which the sulphuret is seen gradually passing into the carbonate. It takes the name of "*dry bone*" from its cellular, bone-like texture, and is usually contaminated more or less by various impurities, as oxide of iron, clay, lime, etc. This is the only form of zinc ore found in the north-west, that is of any value for the manufacture of metallic zinc.

Copper is also found at some localities in the lead region of the north-west, in the form of *copper pyrites*, or *yellow copper* ore, which is a combination of copper, iron and sulphur in nearly equal proportions. In color and appearance it closely resembles *iron pyrites*, but may be readily distinguished from that mineral by its greater softness. This is not a very abundant ore, however, and copper mining in this region has been generally abandoned, since the discovery of this metal in such abundance in the Lake Superior region.

Iron, in the form of sulphuret, or *iron pyrites*, is quite abundant in the lead mines of this region, but it is of no value in an economical point of view. Hematite, or the per-oxide of iron, is

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also found in small quantities, and has undoubtedly been formed by the decomposition of iron pyrites.

From what we have already said, it will be seen that all the valuable mineral deposits of the north-west occur in the form of sulphurets, or are a combination of the metals with sulphuric acid, and this fact suggests a common cause or origin for them all. The question then naturally suggests itself to the intelligent observer: from whence originated the various metals now found in such abundance in the galena lime-stone, and under what conditions were they deposited? In answer to this inquiry, we shall quote from the report of Prof. J. D. Whitney, on the lead region of the Mississippi, made to the Legislature of Wisconsin, as the highest living authority on this subject.

After discussing the various theories which have been put forth at different times, and by various parties, to account for the occurrence of the lead ores of this region, he goes on to say: "If, then, we inquire by what agent the sulphuretted combinations of the metals now found so abundantly disseminated through the lead region could have been deposited in their present position, we need not look far for an answer, since there is but one agent capable of effecting it, namely: sulphuretted hydrogen gas. This decomposes nearly all metallic solutions, and precipitates the metals in the form of sulphurets, provided the resulting sulphuret is one insoluble in the medium in which the decomposition takes place. If, then, the metallic zinc, lead and iron were present, in solution, in the oceanic waters, at the time of the deposition of the lead-bearing strata, or if the strata became impregnated with these metallic substances, by the infiltration of waters charged with their salts through them, then all that would be needed to produce a deposition of the sulphurets would be a source of sulphuretted hydrogen gas, slowly disengaged in or beneath the rocks, permeated by the metalliferous solutions." * * * * * *

"The agent which we conceive to have been efficient in producing the deposit of the metals which are found in the region in question, was the organic matter of the blue lime-stone and the lower beds of the galena, which, either by its reducing action while thus undergoing decomposition, acted on the sulphates of the metals held in solution in the surrounding waters, and converted them into sulphurets; or, still more directly, generating sulphuretted hydrogen from the sulphur which they themselves contained, furnished the necessary material for the precipitation of the metals as sulphurets."

How wonderful, and how important to the welfare of the human

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the scale of organic being that man, in his pride, feels that they are scarcely worthy of his study or notice—yet to them he is indebted, not only for the vast deposits of mineral wealth in the region under consideration, but for a large proportion of all the metallic wealth which our earth affords. By their decomposition, they afforded the amount of sulphuretted hydrogen gas necessary to precipitate the metals which were held in solution in such abundance in the ancient silurian ocean, and thus, through their agency, the rich deposits of mineral wealth were secured and made available for the use of man.

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OUR NATURAL RESOURCES.

By C. D. Wilber, Secretary Illinois State Natural History Society, Bloomington, Ill.

I propose to write a series of articles on the natural resources of our country, for the purpose of showing how abundantly we have been favored with the materials for present and future prosperity; and also to demonstrate that we, as a nation, judging from the amount and value of our mineral wealth, are only in the morning twilight of success in the three grand divisions of human industry, viz: Agriculture, Manufactures and Commerce. For the presentation of the proposed facts, the present crisis will be a sufficient apology, if any be needed. A great fear of our national poverty having alarmed many of our fellow citizens, it is proper to consult the records of creation and see the great values that have been placed to the credit of the American people, kept in safe trust for us, and waiting only for the awakening of our slumbering energies.

It is quite proper, also, that we look within the limits of our State for some of these illustrations, and we cannot desire a better instance for our general purpose than our *Coal Fields*—their extent, value and products.

The United States contains over 200,000 square miles of coal surface—that is, surface, beneath which may be found from one to ten strata or beds of coal. These great deposits, or basins of coal, are mostly within the northern States, as the following estimate will show:

The Illinois coal field, including a small portion of Indiana and Kentucky, contains 55,000 square miles. The Missouri and Iowa coal field occupies fifty thousand square miles. This embraces Northern Missouri and Southern Iowa. Michigan possesses 12,000 square miles of coal area. The Eastern or Apalachian coal field is divided as follows:

Pennsylvania	16,000 square miles.
Ohio	12,000 square miles.
Maryland	500 square miles.
Virginia	20,000 square miles.
Kentucky	6,000 square miles.
Tennessee	4,000 square miles.
North Carolina	250 square miles.
Alabama	3,000 square miles.
Georgia	150 square miles.

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These estimates are taken from the Geological surveys, but do not include all the coal fields belonging to the United States. Coal has been found in Oregon, also in Dacotah and Northern Minnesota. The above named coal fields are all bituminous, there being only 500 square miles of anthracite coal in our country.

In comparison with these, let us notice the European coals. The estimates are as follows:

Great Britain contains	12,000 square miles.
France contains	1,719 square miles.
Spain contains	3,000 square miles.
Belgium contains	578 square miles.

The rates of consumption of foreign coals have led political economists to inquire how long Europe may use her own coals—the answer is, from 2,000 to 2,500 years.

The total amount of coal in the United States, if placed in a mass, would be equal to 1,100 cubic miles. Now, one cubic mile contains 7,000,000,000 tons, and as our home consumption of coal is nearly 10,000,000 tons per annum, one cubic mile will last 700 years, and 1,100 cubic miles, or the whole amount, will last 770,000 years—a conclusion quite satisfactory to our young and ambitious countrymen. We have made no allowance for the increased rate of the consumption of coal, but even if that was allowed, we would find that our basement or coal cellar contains a quantity sufficient for nearly half a million of years—beyond which we have no particular concern. Paine's water-gas may succeed by that time, and those distant generations may draw their supplies of heat and light from the Atlantic or Pacific.

We may take a still nearer view, and estimate the amount of coal within our own borders: Suppose we consider the Illinois coal field, covering an area of 55,000 square miles, to have only one stream of coal, three feet in thickness. Now, since one cubic yard of coal weighs one ton, and one ton contains 25 bushels, we shall have (with coal at ten cents per bushel, the average price,) $425,920,000,000, as the value of our coal! The cost of the war, or the debt of England, or the wealth of Solomon, are trifles in comparison. It is true this is not money in hand, or in bank, (though it resembles the latter,) but it is a *real* value, and is one of the measures of our National strength.

It is the cheapest source of that wonderful power, STEAM, which carries us into new fields of industry, and as it has been given to us in such vast stores, is it not a mute prophecy of future prosperity?

In our preceding remarks we gave the estimates of the great coal fields, according to the political divisions of the earth; and it was clearly shown that the United States contain 200,000 square miles of coal surface, embracing an inexhaustible supply of all varieties, adapted to all purposes in Arts, Manufactures and Commerce. It need not be argued that coal must henceforth be the

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source of the heat used to convert water into steam, which is the strong power to maintain, defend and advance our national interests. It would be interesting to show, by analysis, the peculiar adaptation of coal to the rapid and economical generation of steam, and its advantages over all other combustible materials, such as wood, oils, turf, etc. Let us compare, for instance, the heat-power of those materials. By the combustion of seasoned wood we obtain 2,867 deg. Fahrenheit.

Turf will give	2,782 deg. F.
Bituminous coal will give	4,082 deg. F.
Anthracite " "	4,170 deg. F.
Coke " "	4,352 deg. F.

Now, in order that heat shall have dominion over the metals, by its transforming power, in the furnace, the melting points of the metals must be within the heat-producing range of coal.

The melting-point of iron, the most useful of the metals, is 3,479 deg. F.—far beyond the heating power of wood, and within the range of coal, giving the latter dominion over iron in all its forms, with a surplus power of nearly 1,000 degrees. Had the heating power of coal been 1,000 deg. lower, or the melting-point of iron 1,000 deg. higher, the human race would have been barbarians until this time, with feeble prospects for improvement in future. Now, since coal is king—king over all metals whose use is essential to the social und political well-being of man, let us estimate its power in figures of Arithmetic instead of Rhetoric.

England constantly employs, upon sea and land, 75,000 steam engines, whose aggregate power is equal to the muscular force of 6,000,000 of human beings, each working 24 hours per day; or allowing the human machine 12 hours rest, equal to the muscular power of 12,000,000 of human beings. Or, taking an estimate for the whole number of steam engines in constant operation, in all countries, on ship and shore, in factories and on railways, we shall find that their combined power is equal to the aggregate muscular power of 500,000,000 of men! The population of the globe, as estimated by geographers, is 1,000,000,000! Now, if, with the courtesy of M. Michelet, we restrict all muscular exertion to the male portion of the race, releasing woman from toil, we can safely estimate the power of steam as equal to that of the entire population of the earth!

But who can properly estimate or realize this power? Setting free from the burdens of ages one thousand millions of human beings—is not *this* liberty to the captive? Do not the oppressed indeed go free? With this all-potent force to dig and forge, form and fashion, spin and weave, build our houses and cultivate our farms—toiling, as a faithful servant, with a thousand eyes and hands—what shall be our progress during the next two centuries? Ours is not the age of steam, but rather the dawn thereof; and yet our advanced civilization, so much our boast, is a *product* of the steam, now scarcely fifty years old.

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Tennyson says—

"Better fifty years of Europe than a thousand of Cathay."

But he could have said, more properly, better fifty years of steam than any thousand of the world's history!

We cannot better conclude this portion of our subject than to introduce the appropriate remarks of Francis Jeffrey:

"The steam engine has become a thing stupendous alike for its force and its flexibility, for the prodigious power which it can exert, and the ease, precision and ductility with which it can be varied, distributed and applied. The trunk of an elephant, that can pick up a pin or rend an oak, is as nothing to it. It can engrave a seal and crush masses of obdurate metal before it; draw out, without breaking, a thread as fine as a gossamer; and lift up a ship of war like a bubble in the air. It can embroider muslin and forge anchors; cut steel into ribands and impel loaded vessels against the fury of the waves and winds.

"It is our improved steam engine that has fought all the recent battles of Europe, and exalted and sustained, through the late tremendous contest, the political greatness of our land. It is the same power which enables us to pay our national debt and to maintain the arduous struggle in which we are still engaged with the skill and capital of countries less oppressed with taxation."

But these are poor and narrow views of its importance. It has increased indefinitely, the mass of human comforts and enjoyments, and rendered cheap and accessible all over the world, the materials of wealth and prosperity. It has armed the feeble hand of man, in short, with a power to which no limits can be assigned; completed the dominion of mind over the most refractory qualities of matter, and laid a sure foundation for all those future miracles of mechanical power, which are to aid and reward the labors of after generations. A comparative view of the merchandise of coals, will assist us much in determining the part which our country is destined to act in this important traffic. The yearly product of—

English coal is	70,000,000 tons.
France produces	6,000,000 "
Belgium produces	9,000,000 "

These amounts, at the rate of $2 per ton, will give as a yearly revenue to—

England	$140,000,000
France	12,000,000
Belgium	18,000,000

The United States, with a coal field ten times as large as those of Europe combined, consumes but little more than 10,000,000 tons, actually importing, until quite recently, a quantity equal to our exports. It is quite evident from these views, that "our day of glory has not yet arrived," and we may fear it will not, when we consider that we are in debt to England in a sum exceeding

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$500,000,000, for the products of iron and coal—a considerable item in our present emergency. It is not wise to cast reflections upon such a policy, but it would be worse than folly to pursue such a course, with a clear knowledge of our home facilities to meet all demands in this department of productive industry.

In the prairie States, which are abundantly furnished with coal for fuel, we find a splendid illustration of the doctrine of compensation in nature. The beautiful groves of timber crowning the hills, or following the rivers, remain as almost intact as the sacred groves of the ancients. This ought to follow as a choice of our people, or as a law of the land. But the good result has been secured by a higher law, viz: *coal is cheaper than wood.* Hence our groves are actually increasing in size and value, adding greatly to the beauty of this vast cultivated and ornamental park—the State of Illinois.

From experiments made during the last ten years, the following results have been ascertained, relating to the comparative cost of coal and wood as fuel, on railroads generally. If wood cost per cord $6, and coal, per ton, $4 50, the latter is cheaper in the ratio of 65 to 100 on passenger trains, and on freight trains, in the ratio of 71 to 100.

With a train of five cars, the expense with wood as fuel, was seven-eighths of a cent per mile; with coke, five-sixths of a cent per mile; with coal, one-half of a cent per mile.

In the yearly statement of the chief engineer of the Illinois Central Railroad for 1860, we find the cost of running freight engines using coal, was 26,60, and the same using wood, 17,81, or in that ratio per mile.

We shall, in another article, outside of this series, again refer to this important subject—the economy of coal burning for domestic purposes. In the foregoing, we have only aimed to show the prospective greatness of our coal, as a single item of our national prosperity. By referring to the geological maps of Boue and Marcou, and the geological surveys of the several States, one can be greatly instructed by observing the unequal distribution of coals in the States, North and South. Without seeking now to explain the wonderful physical causes, which, operating through long ages, have produced this result, we will simply regard it as a fact of great significance in our political history, declaring in unmistakable terms, the range of industrial activity suited to the great divisions of our commonwealth.

The Southern States, engaged in the culture of cotton and cane, are mostly without the required natural facilities for manufacturing purposes. In the absence of coal, the chief sustenance for engines, and in the absence of the useful metals, they must be confined to the production of the great staples above mentioned. This arrangement, or distribution of means, will induce the North to be a manufacturing, and the South a productive district, necessitating

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at the same time a free and friendly intercourse between the temperate and tropical regions of our country.

Thus, also, a study of the natural sources of our national wealth will show the true pathway to prosperity for individual States. This rule could be applied to most of the States composing the Union, since each State has some peculiar value to offer in the national market, at the same time needing exchanges from the others.

But natural indications, or laws, are seldom heeded in the administration of public affairs. However, we are glad to submit these facts and inferences, not because our interpretations of Nature are realized, but because they are the auspices and foreshadowings of a prosperous future for our glorious Union.

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IRON AND COAL.

In the natural arrangement or order of our economical Geology, it is most proper to place iron and coal together. They are inseparably associated in manifold ways in the progress of human industry and civilization, and we find them alike associated in nature. The great coal fields have large iron deposits or mines near at hand. The State of Pennsylvania, whose coal and iron trade are world-renowned, is a good illustration of this rule. In the same hill or mountain, over many thousand square miles of that State, one can frequently see coal and iron mining at one view. In the vast iron marts of the world, England and Wales, the smoke of the iron foundry and the colliery ascend together and darken the same sky.

Without this general plan, which indicates in an unmistakable manner the wisdom of the Creator in the distribution of the great natural values, we should labor under great disadvantages, for the cost of transporting either the ore or coal would greatly increase the cost of iron.

Coal, or coke—which is cooked or baked coal—is the only material which can be used in reducing or smelting the various ores of iron; and, on the other hand, iron is best adapted to contain and resist the volume and explosive power of steam. Iron is the body and steam the spirit of the great agent of civilization—and we could not successfully use either without coal as the source of heat, or figuratively speaking, as food for this invented giant—the steam engine—whose power to transform earth and man is unlimited. These remarks may seem too general, or imaginative, but a careful study of the properties of iron, and the peculiar capacities of coal, and the known laws of steam, will guide any one to the same conclusion.

Iron is the most valuable of the metals, because it is the most useful. It is also the most widely distributed, no considerable portion of the earth being without it. In the mechanic arts, it is the

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right hand, and indeed has furnished to every man a hundred hands, so that in modern days every person can be Vulcan and Briæreus at the same time. Let any one answer the question what article of food or dress have we which has not been furnished to us with iron hands? The iron age of Lycurgus is nothing compared with ours. We write upon an iron table with a pen of iron. We live in iron houses and sleep on iron beds. We walk upon iron pavements and floors, and sit upon iron chairs. We can attend an iron church, occupy an iron pew, and listen to a sermon written upon iron paper, and return to our iron hearths and firesides. We travel on iron roads in cars made of iron, drawn by iron horses. On the trackless ocean an iron needle points out the way like an unerring finger. We send our lightning messages on strings of iron across the continent, and an iron cable will soon stretch around the earth, and make of the great nations one neighborhood; and lastly, with iron ships we have revolutionized the whole art of modern warfare, and fought and won the greatest battles of history.

The ores of iron are generally sulphurets, that is, a compound made of iron and sulphur, mingled also with other matter, reducing the per cent. of the metal. The smelting of iron ores in the furnaces consists simply in driving away the more volatile portions of the mixed ore, or in melting the iron out of the grasp of the more infusible parts. It is often found nearly pure; but it seems to be a law in the grand economy of nature, that, to keep and preserve the metals from oxidation or rust, they must be united with such other materials that the resulting compound or ore will have little or no affinity with oxygen. By this means the ores of all metals are carefully guarded from destruction through the long ages that must intervene before man shall require them for their varied uses. The most common forms of iron are the Hematite and Specular ores. The former is named from its red appearance, the latter from its crystaline structure. These occur principally in our mountain ranges or districts, which have been subject to volcanic agency. We have also nodular ore, or band ore; also bog iron ore, and pyrites, besides the *fossil* ore, as it is termed in Pennsylvania, being composed of small furruginous shells, which lived in the waters of an ancient era in such vast myriads as to form a

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We cannot better illustrate the magnitude of our iron interests than by placing before our readers a few estimates showing the use of iron for railway purposes. In the State of Illinois, we have, including side tracks, 4,000 miles of railroad, or 8,000 miles of single rail; and, since every three feet weighs, on an average, sixty pounds, the whole amount used in constructing the railways of this State is 422,400 tons, and the average cost, as it is mostly foreign iron, being fifty dollars per ton, we have devoted to this purpose over two hundred millions of dollars. It is proper here to state, also, that Illinois now contains a greater number of miles of railway than any other State in the Union—having exceeded Ohio, her only rival, within the last six months. The whole amount of iron used in the United States has cost over one billion of dollars. It is greatly to be regretted that a large portion of this vast sum is due to Europe for a poor quality of iron, as compared with our home products; and while we do now groan, being burdened with taxes, it gives us but little comfort to know that this immense expenditure is an inexcusable folly, because our own manufacturers could have easily supplied the place of every ton of foreign iron, giving us a far superior article at one-half of the cost which we are now bound to pay as our foreign debt for iron.

In Southern Illinois we began the manufacture of railroad iron, and were able to afford it at $35 per ton. At the same time our agents were abroad, in England and Wales, purchasing iron for our Illinois railroads at $50 per ton; and, including freight, commissions, interest on bonds, etc., the price per ton will amount to $70! It is true this is not our national debt. The public stocks are not pledged for its security, but virtually, by means of this stupendous folly, our railroads are nearly all owned by foreign capitalists, who dictate to us when we may ride, and how much we shall pay per mile. It is offered as an excuse for our spendthrift policy that we could get twenty years' credit, at low rates of interest, abroad, while at home we must pay on delivery of the iron, on account of our limited capital. If this be so, we could have borrowed the money and manufactured our own iron, and saved thirty per cent. of this huge debt.

Let us now add that our railway iron must be replenished every ten years, and we shall have a still larger idea of the American market for iron. We have no means at present of ascertaining the amount of iron now being consumed in the fearful trade of war, but the ordnance, shot, shell and iron ships of our vast national armament must be enormous, and we are very glad to know that in this case we have been obliged to patronize American iron mines and furnaces.

The most extensive iron fields in the world are in the State of Missouri, in Iron county, about 75 miles from St. Louis, connected with the same by a railroad. The Ozark range of mountains is exceedingly rich in minerals, iron occupying the summits, and lead

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being found along the sloping sides. The principal wonder of this extensive range, however, is Pilot Knob, so called from being used as a land mark, or guide to travelers in the early settlement of the country. It is 581 feet high, with a circumference at the base of six miles. It is simply a solid iron cone, so nearly pure, that with a blacksmith's forge, horse shoes have been made from the ore direct. It is estimated to contain 60,000,000 tons, of a quality equal to the best Russia iron. During the past four years it has been worked quite extensively by the Laclede Iron Company, of St. Louis, and the results show that the iron trade of St. Louis, from this source, will be her leading business.

The Iron Mountain proper is six miles north of Pilot Knob. Its entire mass, which is of specular oxide, contains 1,655,280,000 cubic feet, or 230,187,375 tons! But this is only a fraction of the ore at this locality. The nature of the ore, the plutonic character of the associated rocks, and the position of the mineral beneath the level of the valley, and the sedimentary rocks at the base of the mountain, all indicate its igneous origin, and that it extends downward indefinitely. It will yield 3,000,000 tons of iron for every foot of descent. Each person can judge for himself how deep he will be obliged to go in order to get enough.

Shepherd Mountain, two miles distant from Pilot Knob, is both a specular and magnetic oxide of iron. The ore occurs in huge dikes, running in various directions, cutting the mountain into sections. Large quantities of this ore have been sent to Pittsburg, and manufactured into steel, no other ore on the continent being of equal value for this important purpose. One can find on this mountain large masses of natural magnets of great force lying loose or projecting from the main dikes of ore. These are eagerly sought for by travelers, who have carried away large quantities for mineralogical or geological cabinets and museums. The same range of iron bearing hills extends across the southern part of Illinois, in which we find several extensive iron regions, the largest of these is in Union county, others exist in the counties of Hardin and Gallatin.

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COPPER.*

In the three preceding articles, we have treated of iron and coal, considered particularly in reference to our own State. But as it was the design of this series of articles on our natural resources to

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where for illustrations. Within ten years, a great interest has been awakened in regard to our extensive copper deposits. Instead of voyages to Cyprus—whence the name copper is derived—or to Cornwall, or Germany, we are now referred to our own country. The character of the copper minerals of Lake Superior, the wonderful richness of the copper veins of that district, and their development, have awakened a steadily growing interest, which must eventually make it rank as the great copper region of the world. In sixteen years, gigantic results have been attained at many mines, and that country assumes a new interest, from the fact that there the first copper mines of our country have been profitably worked. As we are to give extensive statistics concerning the vast treasures of these regions, it is appropriate to give our readers a brief historical account of the progress of copper mining in the West.

The first record of the occurrence of native, or malleable copper, is found in the accounts of the labors and voyages of the early Jesuit fathers. In the year 1660, Claude Allouez and Pere Marquette, among the Indians of Lake Superior, noticed the occurrence of blocks of copper on the shores of that great inland sea, and the accounts of their voyages are filled with wonderful stories of the wealth of that region.

Mining operations were commenced on the branches of the Ontonagon river, 1771, by Alexander Henry, an Englishman.

In the spring of 1843, that district of land reaching from the Chocolate westerly to the Montreal river, and south to the Wisconsin line, was ceded to the United States. These lands were thrown open to adventurers, and in 1845, a large number of mines had been commenced. But as nothing accurate was known of the geological and mineralogical structure of the country, leases were taken up and lands were indiscriminately located. However, the geological survey by Drs. Houghton and Jackson—subsequently finished by Messrs. Foster and Whitney—brought about a better state of affairs, and explorations were confined to the really productive rocks of the region.

Over three hundred companies have been organized since 1845, to work copper mines, and of these sixty per cent. were formed from 1845 to 1850.

In 1844, the Cliff Mining Company commenced mining in the conglomerate rock, near Copper Harbor. The vein was traced inland some distance. Two shafts were sunk on the lode, and a

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In 1849, the great Minnesota vein was discovered, its course across the country having been marked by ancient pits, the work of an ancient race of miners. One of these pits was opened in the summer of that year and found to be over twenty feet deep on the vein. It was filled with an accumulated mass of clay, sand and vegetable matter, and on penetrating to the depth of eighteen feet, a mass of nearly pure copper, weighing over six tons, was found, which had been raised four feet from its native bed, and secured in that position by timbers placed under it by the unknown miners, and abandoned apparently on account of the difficulty of raising it to the surface. It was marked with blows of stone, hatchets and hammers, many of which have been taken from the fissure.

Copper mining has been vigorously and actively prosecuted by this company. In 1854, it paid its first dividend of thirty dollars per share, and has continued to divide, each year, handsome profits. The value of the stock, originally $66,000, is now about $1,700,000. There are now twenty-six copper mines being wrought, three of which have already paid large dividends. The progressive development of the whole district, however, will be best illustrated by the following table, showing the productiveness of these mines from 1845, to the close of 1861:

1845	1,300 lbs.,	worth	that	year		$300
1846	29 tons.					
1847	239 "					
1848	516 "					
1849	753 "					
1850	640 "	"	"	"		260,000
1851	872 "					
1852	887 "					
1853	1,452 "					
1854	2,300 "					
1855	3,196 "	"	"	"		1,437,000
1856	5,726 "					
1857	5,759 "					
1858	5,896 "					
1859	6,095 "					
1860	8,600 "	"	"	"		2,544,000
1861	10,009 "	"	"	"		3,000,000

The total value of the production up to the close of 1861, was about.....$18,719,000

A rigid system of management has been inaugurated, and mining economies are more thoroughly studied. A new impulse has been given to the study of the geological features and vein phenomena, and improved machinery has been introduced for the purpose of stamping and dressing the mixed rock and copper, as well as for the mechanical handling of the ore, both under the ground and on the surface. The most wonderful progress of the three districts into which the Lake Superior copper region is

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1855, the great Pewabic lodes were discovered, and mining soon commenced. The following year 392 tons were obtained as the result. The annexed table will give the progress of mining in that localily:*

	Tons Mineral.
In 1856 their product was	392
In 1857 " " "	731.5
In 1858 " " "	1132.5
In 1859 " " "	1572.9
In 1860 " " "	3458.7
In 1861 " " "	4638.5

Last year's product yielded, of refined metal, 3,538 tons, worth, at present rates, $1,910,000. The most elaborate and expensive machinery for crushing and concentrating the ores have been erected, examples of which may be seen at the Pewabic and Franklin Companies' mines. The first of these employs sixty-four heads of Wayne's patent stamps, capable of crushing thirty-five hundred tons of mineral rock monthly, at an average cost of eighty-six cents per ton of rock, stamped and washed. Ten tons of rock are treated for every cord of wood consumed. At the Pewabic and Franklin mills Ball's elaborate machinery is employed. Each establishment works four heads and forty-eight washers, capable of crushing and dressing over 3,000 tons of mixed rock and copper monthly, at a cost, in the first instance, of $1 09; in the second, $1 19 per tons. The Portage Lake district, by far the most important of the three sub-divisions of the copper region, takes its name from an arm of Lake Superior, occupying a gorge in the trap and sandstone at the base of Point Kewanaw. In 1858, this district was of but little importance. Its population did not exceed 2,000, and its production was only 1,100 tons of mineral.

In 1859, the wonderful richness of the Pewabic lode was established, and the district became the center of immigration to the copper regions, and in that year 1,600 tons of copper were produced. The whole district now numbers a population of 7,000. The district produced last year 3,539 tons of refined metal. Its commerce has attained considerable magnitude, as may be seen from the fact that during the season of 1861, there arrived at the various landings of this district seventy-four propellers, two hundred steamers and eighteen schooners.

Kewanaw Point district is situated northeast of Portage Lake, and comprises the whole county of Kewanaw. The mines at this point raised, in 1855, 2,234 tons; in 1859, 1,112 tons; in 1860, 1,172 tons; in 1861, 2,152 tons of mineral.

*In order to appreciate these tables of statistics, the reader is informed that copper is worth about $33¼ cts. per pound per ton of 2,000 lbs.; in small quantities 50 cts. per lb.

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The value of the Cliff company mines can be seen from the following table of its productions:

Year.	lbs. copper.	Value.
1855	1,864,197	$475,911 26
1856	2,220,934	535,842 67
1857	2,363,860	497,570 47
1858	2,260,433	475,321 80
1859	1,415,007	290,097 97
1860	2,714,000	(Mineral.)
1861	2,993,000	"

The Ontonagon copper district lies to the southwest of Portage Lake, deriving its name from a principal river of that section, and comprising the whole of Ontonagon county. This contains numerous organizations or mining companies, but three only can be said to be of much importance, namely, Minnesota, National and Rockland. The first has become famous for the very large yields and returns made from it to stockholders. The vein upon which the mine opened was of incredible richness, being mostly mass copper —one single mass of pure copper weighing 450 tons. The yield of the Minnesota mine has been, since 1854, as follows:

	Lbs. Mineral.
1855	2,868,422
1856	3,718,000
1857	4,115,998
1858	3,668,000
1859	3,252,000
1860	4,368,500
1861	3,760,000

The National mine has produced the following amounts for the same series of years:

	Lbs. Mineral.
1855	82,022
1856	204,212
1857	416,982
1858	380,000
1859	647,078
1860	1,442,500
1861	1,886,000

The productive veins are confined to what is called the trap range. This consists of a narrow belt of igneous rocks, varying in width from three to about twelve miles, extending from Lake Superior to the Wisconsin boundary line, for the whole distance it is made up of a series of beds of granite rock, almost infinite in variety, with occasional beds of conglomerate and sandstone. In general, the veins are more highly productive in the beds of amygdaloid than in the compact varieties of the same rock, or in the sand

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nomena in the Lake Superior region." This is only a theory, yet it offers a certain degree of probability, and is confirmed by the striking resemblance of the copper contained in the veins to that which has been obtained in laboratories by galvanic operations. Besides these veins true fissures just described there is another class of copper deposits. These consist of beds of trap rock, with small and large pieces of copper irregularly disseminated throughout. The yield of these beds, as shown by long continued and persevering mining, is not sufficient to pay expenses. At the places where the transverse veins intersect the metalliferous beds, both classes of deposits seem to be richer in metallic contents. The Kewanaw Point copper district contains three mines, namely, Copper Falls, Garden City and the Phœnix. The former company was organized in 1845. The average monthly production is about twenty tons of copper, and the cost of its mining is said to be about $260 per ton. Up to January 1st, the total yield, according to Mr. Whitney, was one hundred tons ingot copper. Since that time the production has been as follows:

	Lbs. Mineral.
1854	230,570
1855	270,367
1856	274,500
1857	———
1858	458,000
1859	684,800
1860	672,008
1861	544,000

The Garden City Mining Company has proceeded as follows:

	Lbs. Mineral.
1858	7,477
1859	None.
1860	3,315
1861	20,730

The Phœnix Mining Company commenced working in the fall of 1844, in the vicinity of Eagle river. Up to 1854, they had obtained twenty tons of refined copper, and since that time their results per year are as follows:

	Lbs. Mineral.
1855	10,847
1856	25,445
1857	39,351
1858	80,000
1859	65,114
1860	62,194
1861	94,000

Copper has been used from the earliest ages. The first mention of it is made in the Scriptures, where it is referred to as brass. Thus, Tubal-Cain, the seventh in descent from Adam, was "an instructor of every artificer in brass and iron." Job tells us that

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mostly copper, and having been overthrown, and lying for a thousand years in fragments, it is said to have taken 900 camels to carry off the pieces. The Aztecs of Mexico made chisels and axes of copper, which are yet found beside large blocks of granite, half finished in the quarries. The Scandinavian Mounds in Denmark exhibit copper utensils of very remote antiquity. In the most ancient coins the alloy is, copper 65 per cent., tin 7 per cent., and lead 28 per cent. The specific gravity of copper is 8 9-10ths, hardness, 2 7-100ths, being the same as that of gold and silver. Its tenacity is next to that of iron. A copper wire one-thirteenth of an inch in diameter will sustain a weight of 300 pounds. Its power of conducting heat is two and a half times that of iron. It expands 1-582 of its length when heated from 32 deg. to 212 deg. F. It melts at a temperature of 2,000 deg. The native ores of copper are very beautiful. The most prized among them are, first, Azurite, or blue carbonate of copper; and second, Malachite, or the green carbonate. This latter is distinguished for its rich, variegated green color and fine texture, admitting of a very high polish. It has been extensively used for tables, vases, ornaments, etc. The mines of Liberia furnish large quantities of it. In the great London exhibition the display of Malachite from Russia was rich and attractive. A pair of doors of this material measured fourteen feet five inches in hight by seven feet in width, requiring the labor of thirty men, day and night, for one year preceding the exhibition. Copper, like most useful minerals, is universally distributed, the greatest portion, until recently, having been furnished from Great Britain. Great quantities are also found along the Andes Mountains, both in North and South America. The Appalachian range also abounds in it. The mountains of Jamaica and Cuba also afford extensive copper mines.

In this State copper has been discovered in JoDaviess county, also at Mineral Point, Wisconsin, where a vein of it has been worked, but not profitably. It also occurs in Southern Illinois, in several counties, intersected by the spurs of the Ozark Mountains. It is found in considerable quantities in the mineral region of Missouri. In general the copper mining interests of our country have not yet been developed. Until quite recently we have imported it at a very heavy expense. This we will do no longer. Lake Superior will afford, as we have seen, millions of dollars' worth annually for thousands of years, so that, with our own resources and home industry, we can have our noble Ship of State not only *iron-clad* but *copper-bottomed.*

CLAYS.

Clays are among the most useful and valuable of our minerals. They enter into every variety of service, and have been used from the earliest antiquity. They are also universally distributed.

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The term clay is applied to certain compounds of silex and alumina, which are deposited in water—saline or fresh—in every part of the globe. It is a fine sediment or precipitation, and forms in beds a tough, plastic, laminated substance, which can be moulded into any shape, which it retains when dry. When partly fused it acquires the characteristics of glass, and hence is used instead. The elements which enter into the composition of clays are chiefly two, already named. But when, as is often the case, oxide of iron, carbonate of lime, or alkalies, are present, they have a peculiar color, according as the presence or absence of the above materials would indicate. The materials of which clay is composed have been derived from the disintegration of the oldest rocks, and most clay beds of the present time are simply decomposed masses of granite. Granite is composed, as is well known, of three minerals—quartz, feldspar and mica, the two former being soluble in water, in which state they are united with alumina. They are found also in solution in all waters, from which results the useful compound which is the subject of our sketch.

The following analysis of several specimens of fire clays will show their construction, and will indicate the amount of each element present, silica and alumina being the largest portions. The figures 1, 2, 3, etc., indicate the number of the specimens analyzed:

Substances.	1	2	3	4	5	6	7
Silica	51.10	47.55	48.55	51.11	71.28	83.29	69.25
Alumina	31.35	29.50	30.25	30.40	17.75	8.10	17.90
Oxide of iron	4.68	9.13	4.06	4.91		1.88	2.97
Lime	1.46	1.34	1.66	1.76	2.43	2.99	1.30
Magnesia	1.54	0.71	1.91	.....	2.30		
Water and organic matter	10.47	12.01	10.67	12.29	6.94	8.64	7.58

The common names given to this article vary according to its uses. The common clay of our soils is generally mingled with a proportion of sand. In its natural state it absorbs large quantities of water, which, when heated, is driven off, the mass being diminished in bulk. This is the reason why all clays shrink by heat, and as it shrinks in equal measures with equal degrees of heat, it has been used as a thermometer in measuring heat of great intensity. When pure it will bear the most intense heat without melting, and hence is well fitted for crucibles and fire brick. This is the only substance that can be successfully used for these valuable purposes. If it is necessary to have iron, lead, tin and the useful minerals, it is quite as necessary to have clays to serve as melting pots, which are essential in the process of smelting. When clays are impure they will melt at a lower degree of temperature—the silex of the outside portion turning to glass, forming what is called the glaze. The most common clay, distributed everywhere, is denominated *brick clay*, in the manufacture of which it is extensively

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mingled with sand to prevent its shriking, and to add, also, to the strength of the article manufactured. The most valuable varieties of clay are those used for the manufacture of porcelain. They are called, also, *kaolin*. We have, also, *potter's clay*, of which abundant use is made in the manufacture of earthern ware; also *fire clay*, which is used for fire brick, crucibles and furnaces, besides *pipe clay*, the use of which is known to everybody, and *floating clay*, of which a kind of brick is made, used in Europe. Kaolin is derived from a Chinese word *Kaoling*, which is the name of a high ridge in China where this mineral is obtained. Its composition is alumina, 44 parts; silica, 41 parts; water, 15 parts.

It is a noticeable fact, at least, that the great law of economy prevails in the distribution of clays and minerals. We also find them underlying nearly every coal seam with a single stratum, varying from ten inches to twenty feet. Iron is also found in exhaustless quantities in the vicinity of coal measures. Limestone, too, is the constant attendant of clays and coals. Let us now observe the combination of uses to produce coke, or desulphurized coal. Clay is necessary for the furnaces or ovens because it retains its form and will not melt. It is also indispensable in constructing cupolas of iron furnaces. It is also needful (being mingled with sand) to make the mould for castings, giving permanence and finish to the matrix in which all cast iron forms and figures are made. Lime is indispensable as a flux in furnaces, to carry off as scoriæ or slag, the impurities in smelting ores. Hence, in mineral districts this wonderful combination of clays, coals, lime and iron is indispensable—all uniting to produce articles of iron manufacture which are of greatest need to the human race. It would be deeply interesting to our readers to learn the chemical laws by which the above named materials are rendered so useful in the arts. It would illustrate the philosophy of mutual dependence, which is quite as apparent in the natural as in the moral world. It would also show that each of the great mineral formations is crowded to excess with utilities for man, only a portion of which we may presume to have thus far discovered. Clays, in their natural state, are impervious to water, and for this reason, when deep borings are made through extensive clay or argillaceous beds we have artesian wells, the water rising in the orifice made through the clay, which had kept it back. It is also for this reason that all portions of the country are dotted with swamps or wet places, the ground being underlaid with clay, and the immediate region being depressed. The waters are thus retained, giving rise to aqueous vegetation, peat, etc. Now cut through the clay bed, laterally or vertically, and the swamp becomes dry ground. All peat swamps may be accounted for in the manner above described; and, as all our coal fields or basins were once extensive swamps, filled with the exuberant vegetation of tropical forests, we may infer the important office performed by our clay beds in the construction of

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those wonderful treasures, the great coal deposits of our country. In proof of this important position the reader need only remember that 99-100 of all our coal fields are concave or basin shaped, and are underlaid with clay—the very conditions necessary to have produced ancient swamps, filled with the magnificent flora of the coal period.

The manufacture of pottery, from our own clays, has been carried on quite extensively, and is now attracting considerable attention. Several establishments, on an extensive scale, are in active operation. The largest of these is at Peoria, under the management of Mr. Anderson, for the American Pottery Company. We recently visited these works, and were delighted to see varieties and styles of crockery equaling the beauty and finish of imported ware. The pleasure was not hightened by the reflection that our people will persist in sending abroad and paying annually millions of dollars in three-fold prices for the same or inferior articles.

In Southern Illinois we have the greatest variety of valuable clays for all purposes. An extensive deposit of light pure clay occurs near Mound City, adjacent to the Grand Chain, as it is called, on the Ohio River. It has a light yellow color and produces beautiful ware. The proprietor of the pottery works at Mound City, Mr. H. Hainer, succeeded in manufacturing a great variety of ware, and coating or lining each article with a uniform thickness of glass. This result or discovery is very desirable, especially in fruit jars, which was the leading article of the establishment.

The range of mountains running across Southern Illinois is interspersed with beds of clay, or kaolin—that is, such clays as will produce the finest qualities of crockery. We have visited many of these deposits, some tinged with delicate hues, and others almost pure white. These will prove at no distant day, a source of great profit to the enterprising manufacturer.

A considerable number of these kaolin beds, have been discovered near the Illinois Central railroad, in the vicinity of Cobden and Anna, which are eligible situations for manufacturers of this new and important traffic in our State.

A peculiar clay has been found at Utica, on the C. & R. I. R. R., which is extensively used in the manufacture of cement. It consists of a stratum several feet in thickness, occurring in the silurian series of rocks. It is burned as lime, simply to expel volatile organic matter, water, etc. The same stratum occurs in other portions of the State, under similar conditions.

It was our design in this brief notice simply to call attention to this important item of our mineral wealth, of which so little is known by our fellow citizens.

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LIME.

We seldom estimate the wealth of our country in the most common of the great values bestowed upon us. He who would write of the air, or water, or of the soils, must possess brilliancy of diction, as well as great knowledge, if he expects to detain our attention long upon themes so common. It is for the reason that they are always present with us that we are willing to continue in ignorance of the simplest materials of our national wealth and independence. We generally say "of course" to all facts and statements upon such subjects, and are more curious to learn the composition of aerolites than the wonderful construction of the earth's crust. Lime, or limestone, is found in nearly all parts of the globe. In the Mississippi valley it is the prevailing rock, and in Illinois it makes up nineteen-twentieths of all our series of rock formations. We can say of our noble State what may sometimes be said of a grand palace, that its foundations were laid with marble. Limestone is a combination of several common elements. It is made of carbon, oxygen and a metal called calcium. The two former are derived from the atmosphere, the latter is of the earth, but it is not found, except in union with other elements. The three elements already mentioned, by the operation of the geological forces and chemical agencies have been brought together in vast quantities, giving us a material which is crowded full of uses. It is called, in scientific language, carbonate of lime, a term which explains its composition. The common names are, marble, freestone, limestone, etc., etc. In geology terms are applied to it which are derived from the peculiar fossils or animal remains contained in it. Thus the great stratum or layer of limestone in the northern part of the State is termed Niagara limestone, because it contains the same or similar fossils as are found in the great beds at Niagara Falls. Trenton limestone, which abounds largely, was named from Trenton Falls, when it was first examined and its peculiar fossils determined. We have also other names, viz: Galena, Burlington and St. Louis limestone—all indicating peculiar species of fossil remains found in the rocks at or near those localities. Nothing can be more interesting than the process of forming the layers or shales of limestone by the ordinary processes of nature. It goes on at all times and in all places, in the midst of the great oceans and seas. Let us understand first that calcium, which is the metallic base of lime, is soluble in water, and exists in vast quantities in the ocean. Then, at the surface, the waters are swept over by an atmosphere containing carbon and oxygen, the other two elements which unite with calcium, forming a white powder, which is then precipitated to the bottom. Like myriads of snow-flakes falling upon the earth, so this oceanic snow-storm, or snow-fall, descends to the lowest level of the watery wastes. These accumulations continue until great depths of this material

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are distributed over a large area, and as they are heavily pressed by the mass of waters above they become compact. Ages afterward, when the waters are gathered together in another place and the dry land appears, these sediments become what is called limestone, the subject of our sketch. It is easy to see in this process the means by which shells and all species of life in the waters become imbedded in lime rock. Our great limestone beds thus become, themselves, complete museums, containing the entire series of animal existence which sported in the waters during the period required for the extensive lime sediments. It is thought by some writers that the lime deposits in the oceanic waters are greatly facilitated by the action of the myriads of insects, or microscopic animals, which abound in the seas. This explains their economy in the great work of world building, and shows that the Creator employs the humblest means to accomplish the grandest results.

The uses of lime are so obvious as not to need remark here; these are not so interesting now as the processes for preparing it. However, the extent to which it is used for building and agricultural purposes—for cements, ornaments and monuments, is quite astonishing. The farmer must have it diffused through every acre of his farm, or his crops will fail; with it he must build the foundation of his house and make the interior walls like stone; from it his own bones are made—here we may say that lime gives a man *standing* in society. In this view a certain chemist has well said that a man is simply twenty-five pounds of lime distributed through four pails of water. From it with mysterious fingers, myriads of animals dwelling in the sea build their houses and ornament them with all the tints of the clouds and flowers. The statuary carves it into history, and gives us in imperishable forms the heroes of the past; and at last man passes away leaving a limestone tablet to mark—often a few years—a small deposit of like material below. To give our paper a more practical turn, we may refer to the economy of lime-burning, or preparing, which is done in kilns, which are of two kinds, perpetual and intermittent; the former being chiefly used at present, the following statistics taken from the American Encyclopedia, will answer our purpose better than any extended description:

"The product of lime to the fuel consumed is very variable; the difference being chiefly due to the different kilns and methods of burning. The intermittent kilns of the Pyrennees in the form of a truncated cone, produce by measure 1 of lime to 2½ of wood. The perpetual kilns of Littry produce 1 of lime with 0:36 of bituminous coal. The product of the Hastings perpetual kiln was about 1 of lime to 0:30 of best coal. If the full benefit of the fuel be obtained, the consumption should be 1-10 the weight of dry wood, or if coal, 43-1000 of the weight of the lime. There is still, therefore, great waste of fuel on the quantity theoretically required.

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The specific gravity of limestone is reduced by burning, from $\frac{1}{3}$ to $\frac{1}{4}$, and the volume by 10 to 20 per cent. A cubic foot of Radersdorf limestone, weighing 93 pounds was reduced by burning to 48 pounds, and stones weighing 100 pounds, and occupying a space represented by 209 were found after burning to be reduced to 183 in bulk."

The cheapness of lime for agricultural purposes may be inferred from the following sketch of its manufacture at Haverstraw, on the Hudson River: "The ledges of limestone form the river cliffs, and against these are built fifty-nine kilns, capable of producing daily 250 bushels each, of slaked lime, or 125 bushels of quicklime. Of this number, twenty-five are kept in constant operation, making from 6000 to 7000 bushels per day. The kilns are built in pairs, each pair discharging into one arch. The fuel is mixed dust and pea coals costing about $2 per ton. A ton burns 200 bushels of slaked lime, thus making the cost of fuel one cent per bushel. The whole expense per 100 bushels does not exceed $2 35. It sells readily at $3 50, which is seven cents per bushel for quicklime."

BLOOMINGTON, *October*, 1869.

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ON THE CULTURE AND MANAGEMENT OF TOBACCO.

By L. J. Bradford, President of the Kentucky State Agricultural Society.

The success of a growing crop of tobacco depending much upon early planting, the selection of such situations for plant beds as will insure a proper exposure to the sun, is all important. The eastern or southern slopes of hills, near their base, afford the best locations, the beds so situated being free from sobbing, and the warmth of the sun greater than upon flat surface. Regard should also be had to the character of the soil. It should be sufficiently close to render it retentive of moisture, and yet contain sand enough to give it quickness; made earths and puffy soils are unfit, being both too arid and liable to heave. Beds prepared in the early part of the season require more burning than those at a later period. There is but little danger of burning too hard, however, at any time, as the plants generally succeed best upon the beds most thoroughly burned. After the beds are thus burnt and cooled off, they are dug up with a common sprouting hoe to a depth sufficient to afford the plant a loose soil in which to extend its roots. Care should be taken to leave the surface soil as much on top, in the preparation of the bed, as possible, as the young plants will take a quicker and better growth. After the bed is well pulverized by hoeing and raking, the seed mixed with dry ashes are to be sowed as evenly as possible over the surface, at the ratio of a common table spoonful to every eighty square yards, (cubic measure,) the bed lightly raked over or trodden evenly with the feet and well covered with brush, on which there should be no leaves, and protected from the intrusion of stock. So soon as the young plants attain the size of a dollar the brush may be removed—if the weather is dry the brush may be suffered to remain to advantage, and when removed taken off in the evening. With seasonable weather, the plants will soon be large enough for transplanting.

The land designed for the crop should be fertile—if not naturally so, should be made so by manuring. Any common manure will answer a valuable purpose, tobacco being a plant that delights in a rich soil. The land should be deeply and thoroughly plowed, whenever practicable, in the fall or winter. In this there is a two-

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fold advantage: 1st, It destroys many insects that injure or destroy the young plant. 2d. It renders the land more friable and more easily cultivated. As the season approaches for planting out the weed (which is here from May to July,) the land should be plowed again and kept clean. It is then to be laid off with a plow three and a half feet one way and three feet the other, and a small hill made in or on the check as may be preferred, for the reception of the plant. The hill should be raised a little above the common level of the surface—the size of the hill being a matter of fancy with the planter, and not regarded as a matter of consequence in general. So soon as the plants have attained a sufficient size for transplanting, they may be drawn from the bed and placed on the hills whenever there is moisture enough to prevent their dying. This is generally done after a shower; but should the land be very wet, it is best to wait until it dries or settles some, as the plant will do better set when the land is not too wet. The plant, if it survives the transplanting, will soon commence growing, and requires no attention until the weeds and grass begin to make their appearance, and must be subdued by the plow and hoe. Should the earth beecom hard about the plant, or the hill should be lightly scraped with a hoe. This will greatly promote the growth of the plant. When the plant becomes large enough, the bottom or plant leaves may be broken off. This is called pruning, and the land may then be deeply and thoroughly plowed, taking care not to injure the roots of the plant, and the plant hilled up by following with hoes, and throwing the loose soil around it. In land that has been kept clean, this may be the last plowing; the weeds and bushes may be kept down with the hoe, should any appear.

When the plant is large enough to top, the leaves nearest the ground are to be broken off and the bud taken out, leaving on the stalk the number designed for the plant. The number of leaves, as was remarked about the size of the hill, is much a matter of fancy, yet it has more to do in forming the future character of the tobacco than most planters seem apprised of. Experience has fully demonstrated that ten leaves are sufficient for a plant, and this is almost a universal practice among our best planters. The first plants, if the crop has grown off unevenly, may be placed to twelve leaves; the next topping may be ten, and as the season advances, the number may be lessened, as the appearance of the crop and season indicate. This will insure more uniformity in maturing of the crop, saves much labor, and adds to the value of the crop, making it more uniform in quality. At this stage of the crop the care and attention of the planter is almost constantly required to keep off the worms and other insects which prey upon it, and in breaking off the suckers which soon appear upon the stalk at every leaf. Ample employment may be afforded to every idler about the premises.

As the plant approaches maturity, it begins to thicken, and assumes a stiff, slick, and motley appearance, which the most unprac-

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ticed eye will readily detect. Should the weather be favorable, (viz: dry) the first ripe plants may be permitted to remain standing until a sufficient quantity is matured to satisfy the planter in making a regular cutting. If, however, the weather be unpropitious, it is best to cut as fast as it matures, as it is subject to injury under such circumstances if suffered to remain too long. The harvesting of the crop is an important period in its cultivation, and neglect upon the part of the planter will bring loss in its future value. In cutting the plant, a sharp knife is to be used, and the stalk to be split about half its length, taking care not to break the leaves or otherwise injuring them, and the plant to be set with the but of the stalk up, exposed to the sun. So soon as the plant is wilted enough to handle without breaking, they should be taken up and laid in a heap of seven to nine in a place, being governed by their size, and hung as soon as possible to prevent being scorched by the sun. The after part of the day is best for cutting; there is less danger of getting the plant sunburnt. The sticks upon which the plants are hung are small pieces of timber four feet long, and of sufficient size to support the plants. These are taken to the barn on a cart or wagon after receiving the plants, or may be placed upon scaffolds in the fields, at the option of the planter. If the weather is fair, it is best to sun it, as it aids the curing, and adds to the strength and elasticity of the leaf after it is cured. Care should be taken not to place the sticks too close, if the weather be damp and warm, as there is danger of injuring the plant. After remaining on the scaffold a few days it becomes yellow, or assumes the color of a leaf in autumn; it must then be carried to the barn or curing house, and placed away, keeping the sticks far enough apart to secure a free circulation of air through them. If the weather is wet, it is best to take the plants to the house at once, and let the yellowing process take place in the house rather than risk the changes in the weather, as rain is always injurious to the plant after it is cut, and especially so after it becomes yellow.

The curing process is one of the most important in the future value of the crop, and too much care cannot be given it, a small neglect lessening the value of the crop seriously. If the weather is dry and the tobacco is not too much crowded in the house, the action of the atmosphere, assisted by a small portion of fire, will be sufficient to effect the object. If, however, the weather is warm and damp, the atmosphere will not aid very materially in curing the plant, and unless firing is resorted to, the plant is certain to be more or less injured. It is always safer after a house is filled with green tobacco to rely upon the action of the fire to a considerable extent. These should be small and slow at first, and continued so until the tobacco is clear of the moisture engendered by the fire, is dried out, and then increased until the leaf is nearly cured. When this is the case, the fires should be suffered to go out, and the tobacco be suffered to come in case, or get soft again. The

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quality of the article will be improved by permitting it to come in case once or twice before it is thoroughly cured in stem and stalk. Dry and sound wood is best for firing. If the object of the planter is to make a piebald or fancy article, care should be taken never to permit the leaf to get very soft during the curing process; and to make a really fancy article, the tobacco must be thoroughly yellowed before, and cured entirely by fire. This particular description is, however, not more desirable or valuable to the consumer, as the essential properties of the plant are frequently destroyed by the action of the fire. As a general thing, it is better to cure the weed by a natural process of air and the action of the atmosphere, and where the planter is provided with a sufficient quantity of room to house the crop without crowding too close, the object can be attained without the aid of much fire, and the wood and danger of burning the crop saved, and in some markets increase the value of the crop.

Having now arrived at the time when it is supposed the planter has secured and cured the crop, we proceed to give some directions in its future management and preparation for market—remarking that many, after all their previous care and labor, lose its profits to a good extent by either a want of knowledge as to its management, or a carelessness which is inexcusable on their part.

After the tobacco has been thoroughly cured in stem and stalk, it is then ready to commence stripping or taking the leaves from the stalk. In this process the plant first passes through the hands of the most experienced laborer on the farm, who takes off the bad or injured leaves and ties them neatly in bundles of eight or ten. The plants that are thus culled are given to others, who strip off the remaining leaves, and tie them in bands of six or eight leaves, wrapping tightly and neatly with the tip of the leaf used as a tie, so as to form a head of one and a half to two inches in length. Care should be had to make the bundles as uniform in size and color as possible, as it adds to the beauty of sample by which it is to be sold. When the day's work is done, let the tobacco, neatly pressed through the hands, be put in a winrow as it is termed, viz: laid straight in a bulk or pile of sufficient length to hold the day or two days' work, and only the width of one bundle and one-half, reversing each course so as to have the heads of the bundles out.

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carefully laying down the tobacco as it is straightened and handed him. When the bulk is finished, weigh it down heavily with logs, or some heavy weight. Care must be taken that the tobacco does not imbibe too much moisture, or get too high in case before it is bulked, as it will injure. So soon as the tobacco becomes soft enough to handle without breaking, it may be put in bulk, and should the stems break a little under the pressure of the bulker's knee, no material damage will be done, provided the leaf does not crumble. A little attention will soon teach the most ignorant the proper order for safe-keeping. The tobacco will be safe in bulk, and will wait the planter's convenience to prize it in hogsheads.

In pr.zing, the different qualities should not be mixed, and if the planter has been careful to keep them separated, no trouble will be had in assorting them when ready to prize. In packing in the hogsheads care should be taken to have every bundle straight, and every leaf to its bundle. From a well packed hogshead, any bundle may be drawn without injury or interruption to the others. The usual way of packing is to commence across the middle of the hogshead, placing the heads of the first course of bundles about eight or ten inches from the outer edge and running the course evenly across; the packer then places the bundles of the next course in the same direction, the heads against the side or edge of the hogshead, and follow the circumference until the heads of the two courses come in contact; after that course is completed, he finishes the other side by placing the heads against the cask as before, so as to have three courses across the cask, the bundles all laid in the same direction, and the next layer is reversed, carefully placing each bundle as it is thrown or handed him. When filled it is subjected to the press or screw and forced down.

Our hogsheads are from forty-four to forty-eight inches across the head, and fifty-eight inches in length, and from 1,800 to 2,000 pounds can be easily prized in them. If the tobacco is large, rich and oily, the harder it is pressed the better, and the better price it commands. These remarks are particularly applicable to those heavy descriptions of tobacco known in Virginia as heavy shipping leaf, and in the West as Clarksville tobacco, where the soil and climate are peculiarly adapted to the production of this description of tobacco. In climates not so well adapted and soil of a different character, the same variety of the weed will assume a different character, being of a finer or coarser texture, as the case may be, light and bulky, and destitute of oil and substance. Tobacco of this description should be managed as before directed, but prized lightly in the casks so as to admit of a free and open leaf, such being mostly required for cigar leaf.

The writer has been a close observer of tobacco sales for several years, and has seen a difference of two to five dollars per cwt. produced in crops grown on adjoining farms, cultivated in the same

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manner, and sold on the same day. The buyer must take the tobacco as it comes from the planter's hands; he can use only a certain part of it per day. That in safe condition he can keep for future use, and is always willing to pay for it full market rates; that out of condition he must keep until he can use it; and, if he considers his interest, buys at what it will be worth to him when he shall be ready to work it up, thereby throwing on the planter the injury and loss in the tobacco from the time of purchase to that of manufacturing. This loss is considerable. The planter has to bear it; it is right that he should. He has no cause to complain of the manufacturer; if he feels like doing so, let him come here in September or October, and walk into one of our large factories, and take a look at a hogshead then being pulled up, bearing his own name on its head, which he sold in the spring. We presume he would then feel rather more sympathy than blame for the manufacturer, and congratulate himself that he and that tobacco parted long ago. But planters can remedy this evil. It is useless for them to talk about bad seasons for striking, bad winds, cold winds, too much or too little rain, &c. This will not exonerate them from the duty they owe themselves. These bad seasons are not universal. They do not affect every planter; when they do we shall believe them. There are planters who always manage their crops properly, in defiance of too much season, too little season, or any season at all. They are men of reputation as planters, and will do all they can to sustain it. Examine their crops year after year, and they will invariably be found in good condition, and will always bring the highest prices.

All light Tobacco should be air dried instead of drying by fire, if possible, and if fired it should be with furnaces or large stoves, as the smoke injures the taste of fine cutting or manufacturing Tobacco.

AUGUSTA, *February* 2, 1863.

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ON HEMP CULTURE.

By L. J. Bradford, President of the Kentucky State Agricultural Society.

The culture of Hemp is an interest of great and growing importance in the great West. Its production heretofore has been mainly confined to Kentucky and Missouri, but there can be no reasonable doubt in the minds of those who have given the subject the least attention, that Illinois, Iowa, Minnesota and Wisconsin, have vast advantages over the two named States in its production. Many writers have advanced the idea that Hemp, like Cotton, could not be grown by free white labor; and that its production would, for some time at least, be confined to the slave States. Nothing can be farther from the truth. The climate the very best adapted to Hemp growth, is found far north of the home of the negro, and where he would absolutely perish from the effects of climate. Hot, short, quick, forcing seasons of growth, just such as the region referred to actually possesses, are, of all, best adapted to the plant-growth of this great staple, and the day is not distant when the named States will be as noted Hemp producing States as Kentucky and Missouri ever were.

It is to be regretted that in our census returns, Hemp and Flax have been confounded, but it may, however, be safely assumed that the growth and preparation of Hemp is so far below the actual consumption of the country as to assure the Iowa agriculturist of a continued good demand and paying prices for many years to come; and the experience of Kentucky and Missouri has fully proven that the production even of an inferior staple has been and is yet remunerative. The reader must bear in mind the fact that American Hemp is almost exclusively what is technically called *dew rotted*, that is, spread upon the surface of the earth and there rotted by the slow process of the elements. France grows more Hemp than Flax for the linen manufacture, and the finer grades of cordage and twines. The fibre is greatly superior to American, from the fact that her climate is of a lower temperature than that of the portion of this country that grows Hemp, and the further fact that she has

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abundant supplies of pure soft water for steeping in the rotting process; and the same is true of the Russian production. The soil of Kentucky is as well adapted to the growth of this plant as any in Europe or America, but there her adaptedness ends; her general temperature is too high and she is entirely destitute of water of the proper quality for the steeping process; hence all attempts to furnish our Navy from this State have been failures, notwithstanding that department has offered great inducements to her growers to water-rot. Iowa has certainly a climate much colder than Kentucky, and pure soft water in her small lakes and streams without limit, and most certainly a soil equal in fertility to any on the globe. Why may not then her enterprising people reach forth their hands and lay hold of this prize, so well adapted to her soil, climate and situation. In the process of dew-rotting, the fibre, especially in warm climates, is materially deteriorated, and in some cases so far injured as to produce a very low grade of lint, unfit for anything but the very coarsest and lowest grades of bagging. This is especially the case when exposed to the dew process in open wet winters in Kentucky, thus proving that the true Hemp latitude is north of this State. Cold snowy winters, on the contrary, universally produce an improved quality of lint, always brighter and stronger.

CULTURE OF SEED.

The first step in Hemp culture is the production of good sound plump seed. Land intended for seed must be in good tilth and well prepared for planting by early corn-planting. It should be laid off in straight rows four feet apart each way and planted in hills, seven or eight seeds to the hill. The same rules observed for cultivating corn will apply in the after culture of Hemp seed. When the plants reach six or eight inches high, they should be thinned to from three to four plants. Hemp plants are divided into what the farmers call male and female, the former producing the pollen or impregnating powder, the latter bearing the seed. A very little observation will enable the growers to distinguish between them. As soon as they can be distinguished, the male should be drawn up by the root, except here and there a solitary plant left, that the female plants may be properly impregnated. The female is to be retained until its seeds are perfected, when it is to be harvested by cutting at the ground and removal to cover. When cured detach the seed with a stout stick of convenient length, winnow and put in barrels or sacks, perfectly dry, out of the way of rats and mice.

PREPARATION OF LAND.

The soil for Hemp must be a strong calcareous, deep, warm, loamy, perfectly dry one, deeply and thoroughly prepared by plowing and cross-plowing, until a fine state of tilth is produced, more or less according to its previous condition.

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PUTTING IN THE CROP.

The ground having been faithfully prepared, the grower must hasten the operation of seeding with the utmost dispatch, as the earlier the seeding, as a rule, the heavier the lint of the plant. Mark off the land with a small plow and very shallow furrow, or it may be marked off by a drag made of a small log of wood; anything to make a line to guide the sower accurately; then proceed by hand to broad-cast your seed evenly at the rate of fifty pounds of seed per acre as the *minimum*, or even up to seventy pounds as the maximum quantity, varying with the strength of the land; the object being to produce as thick a growth of plants as the land will sustain. If the plants set too thin on rich soil the stalks will grow too coarse, producing a coarse and inferior lint; on the contrary, if seeded to thick, the growth proves so short as to materially affect the value of the crop. In the latitude of the hemp-growing section of Kentucky, the seeding is mostly done from the 1st to the 15th of April, and the land generally plowed the fall before.

In Iowa, the seeding should be done as soon as the ground proves to be in good, dry, working order; although the seed itself seems very tender and its vitality easily affected, and its germination after sowing often seriously disturbed by unfavorable circumstances, yet, when once above ground and fairly set, no ordinary frosts that destroy other vegetation, seem to affect it; hence, but little danger need be apprehended from late frosts, that prove so destructive to corn. The seed being sown, proceed to cover them up with a light harrow by running both ways to secure uniform results. The shallower the seed is covered in a moist soil, the more certain the vegetation. If the season and soil be dry, a somewhat deeper covering may be necessary. Under favorable circumstances, the crop makes its appearance in a few days, and with proper sun and moisture it rapidly covers the ground. From seed time until harvest, the laborer has only to watch its almost magic growth from day to day. After having once covered the ground the crop is generally considered safe by the grower, yet he is sometimes doomed to disappointment. Hail storms prove very destructive to the very tender watery growth of the young hemp plant; high winds damage the yield, but never entirely destroy the crop from seed time until harvest.

RIPENING AND HARVESTING.

The maturity of the crop is indicated by a change of color in the leaf, it gradually fading from a deep green to a paler hue, also a shedding of the leaves, beginning at the bottom of the leaves and gradually extending up the stalk.

The male plants ripen fully ten days in advance of the female, and, in some countries where labor is worth next to nothing, the male is first harvested, by being drawn up by the roots, the female

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being left standing; in our country such a mode of harvesting is impracticable; hence, the American grower must divide the time as near as may be, between the earlier and later ripening, and thus secure the best results possible under the circumstances. The male plant is covered with very minute pods, bearing pollen, which, at maturity, burst and fill the whole atmosphere. It may be seen when the crop is stirred by a brisk breeze rising in immense clouds and floating away from the field. When this is seen in addition to the indications previously named, the crop is ready for the knife.

This instrument is of a peculiar shape, perfected by long experience, and need not here be described. as they can be purchased in the hemp region of Kentucky of almost any smith. The ancient manner of harvesting was by pulling, as with flax, but this mode has long since been abandoned in favor of the hemp-hook, as the knife is called. Of late years, J. B. McCormick, of St. Louis, Mo., and Versailles, Ky., has patented hemp-cutting machinery as an attachment to the McCormick Reaper. The writer has used the attachment and considers it a perfect success; it will supersede the hook in all level lands, and must prove well adapted to Iowa use. In Kentucky, some of her best hemp lands lie so rolling and rough as to perhaps preclude its use. If the crop is to be cut with the hook, the operator is required to cut at one through a width corresponding to the length of the hemp and as close to the ground as possible, spreading his hemp in his rear, in an even, smooth swath, where it remains exposed to the sun's rays until it is properly cured and the leaves sufficiently dried to detach easily. This last operation is sometimes omitted by careless growers, and some contend without injury. The hemp can be shocked or *stooked* (as the yankee would say) with more compactness without the leaves than with them, and any operation having an influence upon the future security of the staple from dampness or atmospheric influence is certainly important; the perfect detachment of all the leaves should then in nowise be omitted. No time should be lost after the stalk is cured in getting the crop up and in neat shocks. Every additional day's exposure to sun, wind, rain or dew, is deteriorating its quality and subtracting from its quantity; the brighter the stalks can be secured the better. The same rules will apply to hemp that obtain in securing good hay. The operator, in taking up the hemp, uses a rude stick cut from the branches of the nearest tree, about the length and weight of a hickory walking cane, taking care to use a fork of the branch. With this primitive but very effective tool he can rapidly draw the stalks into bunches of the proper size for sheaves. In operating, he throws his rude hook forward its full length, and suddenly draws it towards him, each motion making a bunch; this he raises quickly from the ground, and with his hook by a few well directed strokes, divests the plant of its leaves; he then binds his sheaf with its own stalks, and passes on to repeat the operation. Other

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laborers follow and place the hemp in neat close shocks of convenient size, securing the top by a neat band made of hemp stalks themselves, after the manner of shocking corn. Here it is suffered to remain until the whole crop is thus secured; as soon thereafter as possible, selecting clear dry weather for the operation, the whole crop is to be secured by ricking or stacking.

The same rules are to be observed in stacking as with grain—the object being to keep the crop secure and dry until the proper time for rotting arrives; in the latitude of Kentucky, about the middle of October is the proper time. The crop must be retained in the rick or stack, until the summer heats and rains have passed and frost appears instead of dew, the whole crop is then removed from the rick and rehauled back on the same ground on which it grew, there to be spread in thin swaths for rotting, where it remains without turning until properly rotted. This is indicated by the fibre freely parting from the stalk, and the dissolution by the action of the elements of the peculiar substance that causes it to adhere thereto. This stage is only to be learned to perfection by practical experience, yet the novice must have some information to enable him to begin to learn, and it is easily acquired by any one the least observant. When the operator finds his hemp sufficiently rotted, the wooden hook is again brought into requisition for drawing once more the swaths in convenient bunches. The hemp will have lost much of its weight, and can be bunched and shocked with less labor than at first; besides, at this last shocking, the binding is to be omitted entirley; the hemp is to be carefully and neatly handled, all tangling to be avoided, and placed again in neat shocks and firmly bound at the top. Then comes the last and crowning operation—the breaking and dressing the fibre or lint for the market. The peculiar brake to be used, like the knife or hook for cutting, needs no description; they are manufactured in the old hemp regions at a cost of about $5 each, and from long experience have been perfectly adapted to the uses required. The new beginner would save time and money by ordering a sample brake, from which any carpenter can manufacture as desired. The crop is broken in this climate directly from the shock in the open field by the removal of the brake from shock to shock as fast as broken. In Iowa, owing to the severity of the climate, it would probably be necessary to remove the rotted hemp to the barn, where the labor of breaking could be more certainly performed. The coldest and clearest weather is the best for this operation—in fact, excess of dampness in the atmosphere suspends this latter altogether. The breaking process is laborious, yet more depends on the skill than the strength of the laborer.

I have endeavored to describe the whole process as practiced by the best growers in Kentucky. The same mode will certainly apply to Iowa up to the rotting process. With her advantages, steeping in soft water is entirely practicable, by which she will pro-

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duce an article of water-rotted hemp perhaps in no respect inferior to the highest priced Russian, which is fully double the value of American dew-rotted, the only sort produced in this State. The writer is apprehensive that the seasons are too short in Minnesota, Wisconsin and Iowa, for the successful growth of seed, a defect easily remedied by the purchase of seeds grown in more Southern latitudes, but not a shadow of doubt exists in his mind that they can, at the very first effort, produce better hemp than any territory South. Time, he thinks, will demonstrate that Illinois, Iowa, Minnesota and Wisconsin compose the TRUE HEMP REGION of the American continent.

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ROAD MAKING ON THE PRAIRIES OF ILLINOIS.

By H. L. Boms, Sycamore, DeKalb county, Illinois.

A distinguished French traveler has remarked that the degree of civilization to which any country has attained, may be determined by the condition of its roads—the savage being content with a simple trail through the forest—the improvement in roads keeping pace with the improvement of the nation in all other arts, until the highly enlightened community are only satisfied by being rapidly transported over roads of iron, and with the speed of lightning expresses.

This rule, no doubt, is generally true, but were it always so, we should be obliged to class the inhabitants of many parts of our Illinois prairies among a very low grade of barbarians, for more execrable roads than many of ours it would be difficult to find, and a wiser appropriation by the State Society than that toward the encouragement of improvement in roads has not been made. It would not be difficult to give elaborate rules for the construction of admirable roads in a highly scientific manner, were the expense to be disregarded, but to answer the requirements of the committee will require some short, plain, practical directions for constructing and improving the common highways of our prairies, and that at an expense which will be within the reach of even thinly settled neighborhoods.

And, inasmuch as nature has made us most excellent roads over the uplands, these directions will especially apply to the lowlands —to those "sloughs of despond" which so often engulf the weary pilgrim on our prairies in his progress to the celestial or "any other" city.

A cheaply constructed road over them, which shall be passable at all times, and easily kept in repair, is the grand desideratum for our State. The one method by which this can most generally be more completely and thoroughly accomplished than by any other, is the most often neglected. It is to *drain the slough*. It often may be observed that the labor of a road district for many years, amounting in the aggregate to hundreds or thousands of dollars,

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has been laid out upon a turnpike, constructing and re-constructing it, when a half a mile of ditching would have rendered the most of it unnecessary.

There is no certainty of having a secure and permanent road bed constructed from the soil of our prairies, where for any considerable time it must be soaked with standing water. This, then, is a rule of primary importance: If possible, drain the slough.

The size, shape and depth of the drain will be readily determined by the circumstances of the case, but err, if at all, on the safe side, by having it too large and too deep, rather than too small. Then choosing, of course, a dry season of the year, take a breaking team and plow a series of furrows parallel with and on each side of the proposed road bed, leaving at least twenty-two feet in width in the center, and untouched by the plow. Then with sharp spades cut up the thin, tough sods into pieces of a size convenient to handle, and throw them into the centre of the road, reserving enough to sod over the sides of the turnpike when you have it raised.

Your ditch may be extended across the road, cutting it at right angles, as near as convenient, and over it construct a good bridge, remembering that hardly any muddy hollow, however small, should be without its bridge to prevent the accumulation of water on either side.

The common method of building these bridges is probably as good as is practicable. They are, however, frequently built too small, an extraordinary fall of rain sweeping them away, and making necessary their re-construction at increased expense.

A better material for constructing piers or abutments than the logs usually employed, is stone, either the common quarry stone, or the boulders, which may almost anywhere be collected. And it is highly probable that an arched bridge of stone or hard brick may prove the cheapest of all in the end, though costing much the most in original outlay. Where sleepers, however, are used, they should be placed beneath the usual track of the wagon wheels, and the plank should be securely fastened to them. Should there be more than one current cut by the pike, a bridge should be built for each considerable current.

The bridges having now been finished, to return to the road bed. If the soil should be sufficiently dry to admit of the use of a scraper, that should now be employed, and with it the road should be raised to the hight to which the water could be expected to rise. If the scraper cannot be used, the soil must be thrown on by hand, and it will, probably, be found convenient, in order to procure the requisite material, to dig a parallel ditch each side the road. This ditch should be two or three feet distant from the base of the pike, a nearer approach rendering it more liable to allow water to soak into the pike. Our road is, thus far, a mass of loose, black earth. Should the drainage be so complete that this need never be thoroughly saturated, this will pack down and make a good hard

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road—good enough. If, from any cause, it cannot be so well drained it will now be necessary to give it, in some way, cohesiveness and solidity. For this purpose teams may now be sent to the nearest grove, and brush procured enough to thickly cover the road. It should be heavy brush, whose largest limbs should be an inch or two inches in diameter, and should be laid across the road, the more of it the better.

A thin coating of prairie soil may now be thrown on, and upon this, if it can be found within a half a mile, from six to twelve inches of gravel should be laid. If it cannot be procured within a short distance, the soil from the adjoining knoll will be found to answer as a tolerable substitute, vastly superior to the muck of the low lands; but, whichever is put on, it will need a fresh coat for two or three succeeding years, by which time it will have hardened into as good a road as ordinary travel requires. In thus advising the construction of the main part of the pike of the soil adjoining, it must not be inferred that this is wise if gravel is accessible, by no means. A solid gravel road cannot be surpassed, and in endurance and permanence is vastly superior to any other. Pine plank afford an admirable surface covering for the road, but oak are abominable, warping and springing from their places, they are rougher than the corduroy roads of wooded countries, and also expensive. When the turnpike is thus completed, it is well to lay the sods on its side. This gives to the road a neat appearance, and also adds somewhat to its permanency. When well rounded up in the center, to encourage water to run off from the pike, we may call it finished. But it should be borne in mind that in keeping it in repairs "a stitch in time saves nine." A little labor, often applied is worth more than a great deal more laid out, as is too customary, but once a year.

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THE HOG.

ON THE BREEDING, REARING, GENERAL MANAGEMENT OF AND DISEASES OF SWINE, WITH THE COST OF PRODUCING PORK FOR MARKET.

By H. C. Smith, Ridge Farm, Vermilion county, Illinois.

The hog is known all over the world, and is confined to no part in particular. It belongs to the same class of animals as the elephant, the rhinoceros, etc., the thick-skinned or *Pachydermata*.

The utility of the hog is in a great measure owing to its very remarkable fecundity, reproducing at one year old and bringing from eight to ten at a time, and sometimes even more, and that twice a year. Some man of figures has estimated the product of a single sow, with only six young at a time, in ten generations, to be about 6,500,000.

It is estimated that there are raised in the United States annually about forty millions of hogs, which, at $8 per head, amounts to the immense sum of three hundred and twenty millions of dollars. If, then, the hog, or his management, could be so improved as to increase his value one dollar per head, what an immense gain would accrue to the farmer; and no State in or out of the Union is more, or, perhaps, as much interested as Illinois. I have not the statistics at hand to show the figures, but Illinois is decidedly ahead, not only in numbers but in the quality of her hogs. Illinois hogs take pre-eminence in any market in the Union, either East or West.

It certainly then stands our farmers in hand to look to their interests, and see that they have not only the best breeds, but that they are managed in the most profitable manner.

BREEDING AND REARING.

In the selection of breeders much more attention and consideration are necessary than farmers generally imagine. The chief

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tight on the body; a deep carcass and sufficient length of body; let the loin and breast be broad, the breadth of the latter denotes good room for the play of the lungs, and consequently a free, healthy circulation, essential to the thriving and fattening of any animal; the bone should be small and the joints fine, nothing is more indicative of high breeding; the legs should be no longer than when fully fat would just prevent the animal's belly from trailing upon the ground. The leg is the least profitable part of the hog, and we require no more of it than is absolutely necessary to support the rest. See that the feet be firm and sound, that the toes stand close together and are even, upright and healthy. The neck should be short and large in diameter.

Many suppose that the form of the head of a hog is of but little or no consequence, or that a good hog may have an ugly head, but I regard the head of an animal as one of the principal points in which pure or impure breeding will be most obviously indicated. A high bred animal will invariably be found to arrive more speedily at maturity, to take flesh earlier and with greater facility, and altogether turn out more profitably than one of questionable or impure breeding. And such being the case, I consider the head of a hog a point by no means to be overlooked by the purchaser. The description of a head that I consider most likely to indicate high breeding is one of small bone, not too flat on the forehead, the snout short and concave or curving upward; a thin, erect ear, heavy jaw, and a clear, lively eye.

In the selection of a hog the breeder should notice the carriage; if this be dull, heavy or sluggish, reject him as unfit to breed from.

Such a hog as the above will not only live but keep fat and grow on grass alone, while the common, long-legged, slab-sided land-pikes would starve. I have been for several years feeding hogs, and have had almost all kinds common to this part of the country, and have come to the conclusion, from my observation, that it takes no more feed to put one hundred pounds on a high bred hog than it does to put from fifty to seventy-five pounds on the common scrubs of the country, and am satisfied that the meat of the former is far superior to that of the latter, and that a man had better always sell his corn for what he can get than to feed it to scrub hogs. But some men can't bear the idea of paying from ten to fifteen dollars for a good pig. But, suppose that by so doing, they increase the amount of pork they have to sell twenty-five per cent. without any increase of feed—a very low estimate of the difference between good and bad hogs—how many hogs will they have to raise to make their pig clear?

In 1861, I had some hogs on my place that all run together and fared alike in all respects. At ten months old the improved pigs weighed from 250 to 275 pounds, while the scrubs weighed from 150 to 175 pounds. I prefer that the sow should be large boned, longer and coarser made than the boar. After you have selected

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your breeders they should have the very best of care, be well fed on good wholesome food, containing a large proportion of nitrogenous compounds to form bone and muscle. They should not be allowed to become over fat, as that dwarfs and deforms them; nor should they be too closely confined, but allowed plenty of exercise, a good, clean, dry bed, often changed, and not allowed to breed until at least one year old. Much depends on their early treatment. If you select properly, and give them good treatment, you may expect the offspring to be better than the parents, and by continuing to select skillfully and treat properly, you may improve your stock to almost any extent, while if you are a little careless in the selection, and then neglect them while young, you may ruin the very best of stock.

When the boar is used he should be in a good, thriving condition, well fed and furnished comfortable quarters; and after the sow is put to the boar she should be well cared for and given plenty of good, nourishing food, but not confined too close. I prefer to have pigs dropped in March or April, and as the weather is usually bad at that season, it is necessary to have a good, tight, well ventilated house, with a good floor, and a small yard into which each sow can run at pleasure. The sow should be confined to a stall a week or ten days previous to dropping her pigs, and from two to four weeks afterwards, when, if the weather is good and the ground dry, she may be turned out in the day and allowed to return to her bed at night, and out of storms, as long as she chooses. As soon as grass can be had, the sow and her pigs should be turned on it; clover is best, but any of our tame grasses will do, blue grass perhaps next to clover. The sow should be fed on some light diet, and given plenty of water for a few days after she drops her pigs, after which she should be fed all she can eat of good, nourishing food, with plenty of salt. When the pigs have learned to eat they should have some place to be fed, separate from any other hogs, and be allowed to go in and eat at their pleasure, until the sow weans them, which she will usually do at from ten to twelve weeks old, after which they may be turned with the older stock hogs. But if it is designed that the sow raise two litters a year, I should prefer having the first dropped by the first of March or a little earlier, and take them from the sow at about eight weeks old, and turn her to the boar again.

The feeding of stock hogs should depend on the price of corn. If it is not worth over twenty-five cents per bushel, it will usually be found profitable to feed them about what corn they will eat all the year, and let them run on grass during the summer, but if corn is worth more than twenty-five cents, it will perhaps pay to make them eat more grass by feeding less corn. When that is the case, it is best to feed corn but once per day in the evening; if fed corn in the morning, they will not eat much grass in hot weather, when they should be furnished with shade and plenty of water to

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drink and wallow in. All hogs should have all the year what salt they will eat at least once a week; when fattening I give it three times a week, or keep it within their reach.

FATTENING.

The fattening of hogs, though not requiring as much care as some other points, is one that will pay, and amply pay, for good attention. When a hog is to be fattened his wants should be carefully attended to in every respect. He should be made perfectly contented and comfortable, and fed just what corn he will eat up clean three times per day; the times of feeding should be as regular as possible. He should have plenty of good, clean water to drink, and all the salt and stone coal (or other form of carbon) he will eat, which is no small amount.

The best pen I have ever found to fatten hogs in is a good clover or blue grass pasture of about twenty acres for one hundred head of hogs. As to grinding or cooking corn for hogs, I don't think either will pay when the price is less than forty or fifty cents per bushel, and perhaps not then. I have tried it some little, though not enough to speak positively on this point.

It usually takes about three months, and fifteen bushels of corn to fatten a hog well, and he should gain at least 200 pounds on this amount of feed. Fattening should be done before the weather gets bad in the winter. Hogs should be fat and sold by the first and at the latest by the middle of December, as much less feed will do in good than in bad weather.

COST OF PRODUCING PORK FOR MARKET.

Before considering this point, I will notice some of the different breeds, as the breed of hogs we have has much to do with the cost and quality of our pork. The hog is a much neglected animal, yet neglect him as we will, we are bound to acknowledge that hog raising is one of the most important branches of Western industry. He conveys to market more corn than all our vast net work of railroads. This being the fact, would it not be well for us to inquire which family of hogs will ship our corn to the greatest advantage, giving us the best returns therefor. I know that most of us have our favorite breeds that we consider better suited to our wants than any other; and perhaps the same hog could not suit all classes, because some want a hog that will consume the most corn with the least trouble, (and of course the least profit) while others, who are not so stingy of their care and attention to Mr. Hog, prefer one that will make the most pork from a bushel of corn. But I would caution the reader against being led away by mere name, or the puffing of some unscrupulous or ignorant vender, in his selection of a breed of hogs. A hog may be called a Berkshire, a Suffolk, or any other name most esteemed, and yet may, in reality, possess none of the true blood. The only sure means by which the buyer will be

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able to avoid imposition is to make *name* always *secondary to points.* If you find a hog possessed of such points as are calculated to insure early maturity and facility of taking on flesh, you need care little what it has seemed good to the seller to call him.

As to the different breeds of pure blood, I have tried several of them, such as the Berkshire, Suffolk, Middlesex, etc., and find some imperfections in all. But the improved Berkshire—that possessed of a dash of the Neapolitan and Chinese varieties—comes perhaps nearer the desired standard than any other pure breed, but I think it is decidedly improved by a cross of the Suffolk. The Berkshire sow is perhaps the best breeder and the best nurse known. This breed will stand more neglect and hard usage than any other; they stand long drives on foot and shipping by railroad remarkably well; they are more compact and weigh more to their looks than any other hog; their skin stands exposure to the prairie mud exceedingly well, and with reasonable care and feed a lot of them will average one pound gain per day until they are from three to five hundred days old. But the majority of Berkshires are a little too round and close built; they have not belly enough, are too active and restless. With a little care these defects might be bred out. Some of the best animals from the stock imported by the Illinois Stock Importation Company, (which, by the way, has done much to improve our farm stock,) are about all that can be desired.

The Berkshire boar which I am now using, (and which took the sweepstakes' premium as the best boar of any age, at the State Fair, held at Decatur, last fall, bred by Mr. Crowder, of Sangamon county, out of imported Siddington,) is particularly well developed in nearly all the points of a good hog. He measures as follows: Length of snout, 10 inches; from top of the head to the point of the shoulder, 10 inches; from the point of the shoulder to the root of the tail, 40 inches; length over all 56 inches; highth, 28 inches; around the neck, 41 inches; around the heart, 60 inches; around the coupling, 58 inches; across the ham, 14 inches. He has a thin coat of fine, smooth hair, a loose, pliable skin, a clear lively eye, a thin, erect ear, stands up well on his feet; has a small head and heavy jaw, and moves about free and easy, is about two years old, and weighs 350 pounds in proper order for service.

The pure Suffolk will make more pork from a bushel of corn than any other hog. I believe this is conceded by all disinterested

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a few hogs to make their own meat and eat the waste of the farm; they will be less liable to injure sheep than any other breed. They are good breeders but poor nurses, and are almost perfect in the points in which the Berkshire is defective. I raised a sow, half Berkshire and half Suffolk, which measured as follows: Length of snout, 6 inches; length of neck, 6 inches; length of body to the root of the tail, 4 feet 7 inches; highth, 2 feet 6 inches; around the neck, 4 feet 2 inches; around the heart, 5 feet 8 inches; around the coupling, 5 feet 7 inches; aross the ham, 16 inches, and weighed 500 pounds in good breeding order; she had a nice coat of fine soft hair, black and white; a soft, smooth skin; a clear, lively eye; stood upright on her feet, and moved about as sprightly as most hogs of 200 pounds; was a good breeder and nurse. This sow gained at one time 92 pounds in four weeks without any extra attention. If a new breed could be made by crossing these two breeds and continuing the cross until the offspring were a uniform mixture between the two, I should consider it the maximum of perfection. But I would not recommend farmers to attempt to make the cross themselves, as breeding fine animals is a science that requires especial taste and skill, and crosses between animals of such different characters, unless skillfully done, generally are not as good as the originals. But I would recommend the farmer to buy, as occasion demands, his breeders of some skillful breeder, and be willing to pay good prices for good animals and breed from none others, and continue to buy from the same herd, or at least from the same family. If this were generally the case, we would soon have plenty of breeders, with the skill of a Collins, a Bakewell, a Webb or an Atwood, because talent will be used where there is a remunerative demand for it.

Until this is the case, we can expect but little improvement in our swine; in fact, it is now on the decline, and hog raising becoming unprofitable, because other farm stock is improving to such an extent as to leave hogs entirely behind. A few examples will show at once the comparative estimate in which improved hogs and other improved animals are held. We frequently hear of bulls selling for one thousand dollars and upwards, and sometimes five or six times that amount. I have noticed lately a number of sales of sheep at ten to twelve hundred dollars, and one for which twenty-five hundred was refused. Who has heard of hogs bringing such prices? No one. But on the other hand, the sweepstakes' boar, above referred to, was put up at auction at the Illinois State Fair, at Decatur, and had to be knocked down at sixteen dollars, while, I presume, if the sweepstakes' buck had been put up at the same time and place, he would not have stopped short of ten to fifteen hundred dollars. I tell you that if the best boar in the State, that weighs over 500 lbs., is worth but sixteen dollars, while common fat hogs are worth four dollars per hundred for

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pork, it is but little worth our while to try to improve our swine or write essays on their breeding and management.

But this is a delusion—a dream from which our farmers must arouse before one of our most important farm animals is degenerated beyond easy recovery. And if by my feeble efforts I can assist in preventing so great a calamity, I shall be more than rewarded for the effort.

The practice of changing about, or introducing an entirely different strain of blood with every change of breeders, is a very unwise one, and results in the conglomerate, unsightly masses of all our farm stock.

The pure Suffolk will not stand the neglect of many, in fact, the majority of the careless farmers of the West. The Middlesex, Essex, Chinese, and numerous others, possess all, or nearly all the bad points of the Suffolk, with but few, or in a low degree, the good ones. The Chester White I am not so well acquainted with, but I have seen quite a number of what were called choice animals, and I have never yet seen one that I considered by any means a first class hog. I have my doubts about their having distinctive points sufficiently well developed to be entitled to the name of a distinct breed.

As the cost of producing pork depends so much on the price of corn, I shall estimate it in bushels of corn, and the reader can readily change it to dollars and cents from the price of corn in his particular case and situation. I have made several experiments in feeding and weighing. The following is one which shows about the average result:

September 13, 1862, I commenced feeding 120 head of hogs, which were of all sizes, from sucking pigs of two months old to hogs of three hundred pounds. The lot weighed 8,500 lbs., an average of 70 5-6 lbs. They were fed in a lot of about ten acres, half of which was in blue grass, but was pastured short. They were furnished with plenty of good water, and all the salt and stone-coal they would eat three times per week. I found they would eat from two to three bushels more corn per day when they had the salt and coal than when it was withheld. I fed them, in 75 days, 660 bushels of corn, and they gained in weight 7,806 lbs., or about one per cent. of their average weight per day, and about 12 lbs. per bushel of corn.

The hogs were, part of them, good Berkshires, Suffolks, a few Chester Whites and their crosses, and the balance, perhaps half the lot, were the common scrubs of the country. I considered

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tion to all the wants of the hog, but from my observation, I don't think the majority of farmers realize over ten pounds per bushel.

But during the winter, unless hogs are housed and better cared for than they usually are in the West, they do well to hold their own in weight. I do not think they usually do that, including those that die; but by housing and good care they will gain about half as much as they usually do in good weather, on the amount of feed consumed. And by this kind of management the farmer may rely on an average of about fifteen pounds of pork per bushel of corn consumed, the year around, while by the common treatment of scrub hogs he realizes from eight to ten pounds.

DISEASES.

In the treatment of the diseases of hogs, I consider the old proverb especially true, "an ounce of preventative is worth more than a pound of cure," because in almost all cases when a hog is once diseased to any considerable extent the cure is worth more than the cured hog. This being the case, it is important that we take especial care to prevent disease among our swine. The hog, if properly treated, is perhaps the least liable to disease of any of our domestic animals, and his wants are few and simple, but from the nature of his habits his few wants are imperative.

The disease known as Cholera, which has made such havoc among our herds for the past few years, is undoubtedly caused by the filthy, careless manner in which we treat our hogs. We have been driving them to it for years, each successive generation continued to have its vitality played upon and its constitution to grow weaker and weaker by continual abuse, until it finally culminated in a disease that carried off hundreds and thousands of the poor creatures, and thus released them from the misery and curse of neglect of their careless owner, and perhaps saved hundreds of human beings from destruction by the use of pork contaminated with corruption and disease. Our only remedy is in a radical change in the care of our hogs.

By suddenly changing from scanty fare of grass, roots, and such other rubbish as the hog can gather up in the streets and lanes, to high feeding of corn or still-slop, the dormant stomach and digestive organs are over-taxed, the food lies undigested in the stomach until it sours and ferments, which produces constipation and irritation throughout the whole digestive apparatus, and by its long continuance the whole system is impregnated with fever and disease. After the disease has far advanced, to attempt a cure will be impracticable, or at least, unprofitable. After a hog has lost his appetite it is very troublesome to administer medicine to him, but by taking it in time, while he will still eat, and give him some slight purgative and some neutralizing substance, with moderate feed of a green, succulent nature, and pure air and free exercise, he will most likely recover.

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I have never had a case of the cholera among my hogs, although it has been in adjoining pastures frequently. My plan of preventing it is, during the grass season to allow my hogs plenty of grass, feed regular, and when I want to raise the feed do it gradually, give my hogs plenty of salt, which stimulates the digestive organs, and allow them free access to stone coal, of which they consume large quantities, and the salt and coal neutralize any acidity that may be created in the stomach before it has time to affect the system.

December 28, 1863.

CELLARS, AND MALARIA FROM.

By Dr. L. S. Pennington, of Sterling, Illinois.

It has been said, and very wisely too, that it is the duty of the State to enforce the laws of vaccination, or rather, that the State should make and enforce on every parent, a stringent law on that subject. There is, however, another subject no less worthy of State and individual attention, affecting to a greater or less degree the sanitary condition of the State. And it is, that the cellar to every dwelling house should, through the chimney, or in some other way, be thoroughly and effectually ventilated, at all times during the year.

In a new country, especially, I am aware this, in most instances, is difficult to be accomplished. The hurried manner in which most of our dwellings are constructed—the want of proper materials, and the great distance often from which they must be brought—are sufficient reasons why so few, even had they fully realized its importance, have availed themselves of its advantage. But that condition of things, to a great extent, has passed away, and, although the State of Illinois is fast improving in point of health, that is no reason why so fertile a source of disease should not be arrested.

The cellar of every farm house is the receptacle of matter that can and does decay. It matters but little whether it be vegetable or animal—decomposition sends forth a poison or bad air, known as malaria. It is so minute and subtile, that it cannot be discovered by the senses, nor by any chemical tests. We should not then be surprised that men, even when slumbering over it, regard it with so much indifference. It is only known by the fatal effects

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which it produces. Our cellars would be incapable of sending forth this poison, to a great extent, were it not that a certain portion of the year they are entirely shut out from the external air. No avenue is left for escape but through the apartments of the dwelling, to be there inhaled, not only by day, but by night, a time when malaria revels without the neutralizing effects of the sun's rays as an opposing agent.

How few of our dwellings are entirely free from this source of disease? We find their inmates living over and breathing from day to day, and from year to year, this tainted air. Coming forth from its imprisoned cell, it is frequently produced in a form so concentrated and virulent, as to produce disease of the most fatal character. Typhoid and other fevers often arise in individuals and families, which cannot, to a casual observer, be accounted for, and too often, to reconcile the living to the loss of friends departed, it is passed over as man's destiny, and as a decree of Providence.

Could we look deeper into the secret cause of disease, we should most likely find it some gross violation of nature's laws. Thus we go on from year to year, from generation to generation, in the beaten track of error, decimating the young and middle aged, before half their time for usefulness is ended.

Cholera has been known to invade many a household, and to cut off almost whole families, having for this (cellar exhalations) an exciting cause. But the more active forms of disease thus engendered are not more to be feared than that slow and insidious form which has too often sapped the best constitution, and cut off in early life, the most promising hopes.

In no house should a chimney be constructed, except from the bottom of the cellar, and no cellar built except it have in it a large open fire-place or air passage, and this at all times kept open and connected with the outer air. Far better have no cellar than one that will, whenever closed, send forth a virus which is ever ready to act as the exciting cause of disease. Could the cellars and vaults of many of our public houses, store-houses, and other places where vegetable or animal matter is suffered to rot, be opened up and their history told, I fear the picture would be a sad one. I can but believe that our people, when they investigate fully this subject, will not be slow to adopt a means so important, and one on which an improved sanitary condition of our State so much depends.

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"THE FENCE QUESTION."

By Wool Grower.

Within a few years we have all been somewhat startled to learn that the fences of the United States have cost more than the houses, cities included; more than the ships, boats and vessels of every description, which sail the ocean, our lakes and rivers; more than our manufactories, of all kinds, with their machinery; more than any one class of property, aside from real estate, except, it may be, the railroads of our country.

In reflecting upon this enormous expenditure, we are inclined to ask whether we get paid for so great an investment, or whether we are, perforce, compelled to make it, whether it pays or not. It is easy to say that the investment both pays and is necessary to save our crops, but this is begging the whole question.

It may be stated, in general terms, that Illinois is owned in quarter section farms. On this hypothesis every man owning such sized farm is compelled to make either one or two miles of five-board fence, or its equivalent—depending on whether he "joins fences" or not—to keep from ten to one hundred head of the various kinds of stock, belonging to himself and neighbors, from destroying his crops. Of course part of this expense is to be charged to his own stock, but that part he is bound to be at under any order of things. If his immediate neighbors and himself have, not to exceed fifty head, he had about as well fence a pasture for all of them as to make his two miles of boundary fence. So, too, with each neighbor. In this manner it has been the fact with a great share of our State, that from six to twenty miles of fence have been made as a protection from, on an average, of not to exceed fifty head of stock. It is easy to see that the pasturage of that amount of stock per year, and the land gained for cultivation, from not having to fence a part of one's farm off for a pasture, (I speak of sections in which there is "range,") will not pay the interest on the money invested in so much fence, together with the yearly cost of repairs of the same. Would it not be cheaper for each man to make a pasture for his own stock than to fence his entire farm against all the stock?

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In my remarks thus far I have proceeded on the supposition that every man had an extensive, or at least, a sufficient range for his stock near his farm; but there are now large portions of our State which are nearly all inclosed, or with but an occasional "quarter" or "eighty" "lying out." In such situation if I make a fence around my entire farm to keep my own and neighbor's stock from my crops, and he does the same to save his crops, just make a calculation what the pasture of a half fed-out "quarter" or two costs us, and it will be seen that four or five of us pay enough eventually to buy two or three such quarters and fence them besides. Does it pay to build ten to sixty miles of fence for the pasturage of such tracts of land?

Every one who has ever thought on the subject has seen that, even in the stock growing State of Illinois, one-fourth to one-tenth of the money expended in *fencing stock out* would *fence it in*, and we would have more stock and particularly *better stock* than under our present system of fenced crops.

I consider our present laws, practices and usages, with regard to fences, the greatest blunder (which Talleyrand said was worse than a crime) the very practical American people have ever made. We got our fencing notions, undoubtedly, in part, from our English ancestors; but even exclusive John Bull, slave as he is to old customs and practices, is ripping up many of his old straggling hedges, thereby obtaining many valuable acres for cultivation, and saving expense. I have sometimes wondered whether the English exclusiveness—"the keeping of a man's self to himself"—had not much to do with the English high walls and hedges.

We flaunt our labor-saving farm machinery in the faces of slow and fogy Germany, France and Continental Europe generally, yet their practice of farming without fences saves more labor and expense than all the farm machinery we have ever made. I bear in mind the cheap labor of Germany and France, and their expensive (would be to us) labor of soiling stock; but the question is not whether we could get along with as little fence as those countries, but whether we do not make much more than is profitable. Even soiling has its advocates in some portions of our country, and some men in New England have demonstrated that it is cheaper than pasturing stock, even with the high priced American labor.

In part, too, our fencing notions came from the peculiar circumstances of the early settled portions of the country. The sea-board States, which were first settled, were almost entirely a timbered country, and the settlers could put in cultivation only so much as they could clear, by immense labor, of the timber. Of course, no matter how large a man's tract of land, he had but a small patch to fence at first. The constant addition of small patches, together with an illimitable supply of fencing material, got him in the way of making much fence. The traditions, sentiments, laws and customs of those early *English* settlers—strengthened and added to by the

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peculiar circumstances of improving heavy timbered countries—have been carried West by descendants of theirs into a country of entirely different character, whose settlement and cultivation proceed in an entirely different manner.

At present many men in opening new farms are compelled to make "Shanghai" or "Bloomer" fences (two-boarded fences,) which every one knows is but little better than no fence. Before they can secure their crops the stock has destroyed one-half of them. Of the great share of men who have opened prairie farms in Illinois the past ten years, ten acres inclosed in pasture, and perhaps five, would have sufficed for their stock. Under our system of fenced crops they have, many of them, spent their means and strained their credit to make from one to two miles of fence to the 160-acre farm. It costs, at present prices of lumber, *crede experto*, in a great share of our State, at least five hundred dollars per mile to make good five-board fence. A man who may have the teams, tools and boys sufficient to tend one hundred and sixty acres is compelled to rent because he has not the money to make the amount of fence necessary to inclose that much land. Two, three and four dollars per acre make a very respectable yearly payment on raw prairie, at ten, twelve and fifteen dollars per acre. Men can better afford to pay fifteen dollars per acre and fence only sufficient for their own small stock, than five dollars per acre and fence their entire farm against, it may be, their richer neighbors' stock, who are much more able to fence. Not that the outside fencing, *per se*, will cost the difference of ten dollars per acre, but that in case he takes care of his own stock and his neighbors do the same, he can commence farming on *his own land years sooner* than in the other case. Of the large class who rent all their lives many would buy land and *pay for it* were it not for the serious expense of fencing it. I know it will be said that in large prairies where fencing is scarce, men may, by mutual agreement, make only so much fence as they please. In many sections it has been tried, but whoever has seen such communities of farmers knows that some stock is constantly ranging over the crops. As each man keeps up his stock merely because it is his pleasure, not because he is compelled to, he becomes extremely careless, knowing that the aggrieved party can only take it out in "cussin'." About three-fourths of all the "cussin'" in Illinois may be fairly charged to the practice of fencing crops rather than stock.

Had Illinois passed a law thirty, twenty, or even ten years since, that stock should be fenced or otherwise taken care of by its owners, I do not believe there would be an acre of good prairie uncultivated in the State. I know this is a strong statement, when we think how many acres of the best land in the world are yet "lying out," but those who have lived in the State but the last ten years have seen miles of prairie come under the plow right around them, even under the crop-fencing incubus. During the wheat

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mania of a few years since a large portion of the prairies of Central Illinois would have been turned bottomside up had it not been for the expense of fencing.

Under a system of unfenced crops, or rather under a law making every man take care of his own stock, I think it probable that Illinois would to-day have had a half million more inhabitants. We should have been richer, our farms better improved, our houses larger and more comfortable and our barns more numerous. We have spent millions of dollars in Michigan pine to keep our corn and wheat from going off our farms to prey on our neighbors' hogs and cattle.

Make every man take care of his own stock, and five farms will be opened to where one now is. Illinois will not much longer be a poor man's country unless something be done to put land in his reach. In the last ten years we have driven farther west thousands of our citizens and prevented thousands of others from coming into the State. Would the law of Illinois but have said to them, "You take care of your own stock and I will make your neighbor take care of his"—had such been the law of the State for the last ten years—I doubt whether the Illinois Central Railroad would now have many acres of good prairie land unsold.

Although a change even now, when so many fences are made, would save to the people of the State millions of dollars, yet I fear that the change will not come in our time. Although nine men out of ten freely admit the great economy of taking care of stock, separate from fencing the crops, yet the idea of living out door, as it were, gives them a cold chill, not reflecting that if it were the law of the land, stock would not commit one depredation on crops where it now does fifty.

From this time on we shall have more competitors for the emigrants, both from foreign countries and more eastern States, than ever before. Ours is now the Empire State of the West, but should Missouri, Kansas, Iowa, or some of the better Southern States, with their cheap lands, make them still cheaper to the settler by inaugurating the system in discussion, it might push us to retain our prestige. Some of the States named are more favorably situated than ours to commence such a system—our sister Western States, by reason of having the great share of their territory never yet fenced, and some of the Southern States, from having their fences swept off by war's destructive broom.

It is estimated that the fences of Illinois have cost somewhere near $100,000,000. Had the law of the State always been that every man should take care of his own stock, every one who has ever given the subject the least thought will agree that one-half the sum would have been saved. It would not only have been saved, but also been added to the *productive* capital of the State. Fences are *dead capital;* they not only pay no interest, but are a constant expense.

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Thus far I have discussed the question on *economical* grounds wholly, but there is another line of argument in favor of the change, still stronger, viz: the present system is *abstractly, morally and socially wrong.* Abstractly and socially the question amounts to this: Shall man keep his stock from trespassing on his neighbor or shall his neighbor compel him to keep his—the neighbor's—stock from his crops? In the one case he attends to the stock belonging to himself—one man and the right party—in the other case he guards against the stock of twenty men. Can any one tell me why every man ought not to take care of his own stock? Is there any good reason why one man should be compelled to build from one to ten miles of fence to protect his crops from his neighbors' stock, when such neighbors might do it with one-tenth the fence? Can any one give me a good reason why the law should be that a man shall stand guard over his one hundred and sixty acres of grain, rather than his neighbor over his one cow? Does, or does it not, seem right that every man shall take care of his own stock? On this hinges the whole question. Is it right that because I have a flock of sheep I shall compel twenty men, who raise grain to sell, and who possess little or no stock, to make a certain number of miles of fence to keep my sheep from their growing crops? There is no reason for it but law and custom. Why should they be compelled to fence their crops, rather than I to fence my sheep? It certainly looks reasonable that so long as a man's crops or stock are on his own land he is not a trespasser. Because I may think stock raising is more profitable than raising grain to sell, is no valid reason why I should compel the grain-raiser to fence his grain, unless I can show that otherwise his corn and wheat, by "going on the rampage," may pass over my boundaries and run down my sheep. The right to fence, or not to fence, is one of the natural, inalienable rights.

I have made no objection to the stock raiser's having as much fence as he pleases; I only ask that he shall not compel his neighbor, who has no stock, to fence for him.

I have had it objected that I would compel all men to go to grain raising. *My idea is that every man shall take care of his own stock; and, as a corrollary, that he shall be compelled to make only so much or so little fence as is necessary to do that thing.* Now, then, wherein would a law to that effect force *all* farmers to raising grain? I can't see wherein it follows that because a man makes only fence sufficient for his particular business, therefore all would, perforce, have to engage in the same business. Because, in setting vineyards, one has nothing to do with fence making, is no reason why all would have to plant vines. Because, in keeping sheep, I am compelled to have much fence, is no reason why my wheat growing neighbors ought to make as much. Because the majority of farmers, perhaps, think a mixed husbandry profitable, is no reason why a farmer should be compelled to fence his corn, his wheat, his

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orchard, his nursery, his market garden, or *any stay-at-home, untrespassing property.*

Shall we put the *onus* of fencing on *stationary* or on *locomotive* property? Shall we burden the man whose property stays at home, and can't do otherwise, with the cost of fencing, or the man whose property is now here now there?

We might get along, as a State, with millions of dollars less in fence that we have to-day. As our people get more stock it might, or it might not be necessary to have more fence, but *let the man who needs the fence make it.*

New York, with all her fences, is now *virtually* under this system, and many of her farmers are taking the fences away from their grain fields to show that they mean it shall be enforced. If necessary to restrain their own stock they will put them back.

I have not intended to be understood that I thought the State would be fenceless from Chicago to Cairo, nor that a man must necessarily *fence* his stock; I wish only to be understood that he shall *take care of it*— herd it, soil it, stake it out, any way so he takes care of it.

It is, by many, thought a very intricate and perplexing matter to frame laws to effect so radical a change in the fencing system of a State, and it is supposed, too, that great confusion would ensue for a long time after such change. To the first objection I answer that it seems very easy for the Legislature to enact a law that from and after such a date all men shall be responsible for all damages done by their stock. Neither do I think any great confusion, loss or embarrassment would grow out of the change—at least none but what a few months would repair. Men would know that in six months or a year (if it seemed best to set that time) they were to do what is just and right—take care of their own stock in whatever manner best suited them.

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MANUFACTURES AND MECHANIC ARTS.

By Dr. L. S. Pennington, Sterling, Illinois.

The State of Illinois may have a proud future before her, or she may have a history which her people may read with shame. States, like individuals, depend much on the wisdom and policy of their laws. If these (laws) are based on the practical experience and far-seeing intelligence of her best minds, such State can but, in the end, enjoy a proud and permanent prosperity. The first object of this, like that of all other States, should be, so far as it can, to provide for the wants of its own people. Such are, and will continue, to stand at the head of independent States. Illinois may be considered at present as almost entirely an agricultural State. Her prosperity during the past decade has been almost unexampled. But we know that this prosperity, without some change in policy, must have an end. Fertility of soil, however great, by a careless cultivation (and that is always the case, when the products are of but little value in the market,) cannot long continue. Those of us that have lived here and cultivated these lands (prairies) for a quarter of a century, know that much of their productive value is already gone. If then a quarter of a century has wrought this perceptible change, does it require prophetic vision to see what will be their (land's) condition, except our system of agriculture improves, two generations hence? We believe that manufactures and mechanic arts combined with agriculture, can alone maintain it in a flourishing condition, and save the soil from ultimate deterioration.

It is to establish and encourage these, that we ask of our legislators some State policy. What that policy or legislation shall be, let the wisdom of our legislators decide.

It is idle to suppose that manufactures will, to any great extent, be established in a new country, without some aid and encouragement. In a new country, a mountain of difficulties are to be overcome. These difficulties must be apparent to every intelligent mind. The large number of failures in attempting to establish a manufacturing business in a new country, is only another evidence for State encouragement. The pioneer in almost every enterprise

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bequeaths a legacy to those that follow him; and in no instance is this more eminently true than with those above mentioned. Old and well established institutions fear not competition, but the failure of those in a new country is not only an individual loss, but a State calamity. Massachusetts could, in her early days, not only foster, but give a bonus for useful manufactures; and that policy which she has never lost sight of, has enabled her, not only to maintain her character creditably at home, but to extend her commerce to the world's most distant markets. Her farmers, as should those of Illinois, find a ready and profitable market for their products at home and within their own State. Men of the largest experience have said, that the wealth of a State depends not on its promises to pay, not on its gold and silver, but on the value and efficiency of its productive skill and labor. If ten (10) men in Massachusetts can by the use of improved machinery produce as much as twenty (20) (men) can (in value) in Illinois by agriculture, is it not plain that the end of the one will be prosperity, while that of the other will be poverty and bankruptcy; and yet the contrast, as the statistics will show, is even greater.

The lessons of history on this subject are so instructive that we cannot too often call them to mind, based as they are on the statistics of our own States and those of other nations. To comprehend more fully the influence which a wise or mistaken policy has in determining and shaping the destiny of a State, we will select the original thirteen. Entering the Confederation of States at the same time, but guided by different councils and policies, the result, after almost a century of unbroken prosperity, is now before us.

The fallacy that great agricultural wealth alone can secure a prosperity like that where the mechanic arts are also established, has nowhere, perhaps, been more clearly exemplified than in what was once the great and ruling (agricultural) States of Virginia, North Carolina, South Carolina and Georgia. The prominent statistics of those States read as follows: 1850 and 1855:

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STATES.	Population in 1790	Population in 1860	Number of square miles	Agricultural products for 1860	Value of mechanical, manufacturing and mining industry
*Virginia	748,308	1,596,318	61,352	.....	$51,300,000
*North Carolina	393,751	992,622	45,000	.....	14,450,000
*South Carolina	249,073	703,708	30,213	.....	6,800,000
*Georgia	82,548	1,067,286	58,000	$29,612,436	13,700,000
†New Hampshire	141,899	326,073	9,280	.....	45,500,000
†Massachusetts	378,717	1,231,066	7,800	21,556,162	266,000,000
†Rhode Island	69,110	174,620	1,046	.....	47,500,000
†Connecticut	238,141	460,147	4,730	.....	83,000,000
†New York	340,120	3,880,735	50,519	.....	379,623,560
†New Jersey	184,139	672,035	8,320	19,322,894	81,000,000
†Pennsylvania	434,373	2,906,115	46,000	.....	285,500,000
†Delaware	59,096	112,216	2,120	.....	9,920,000
†Maryland	319,728	687,049	11,124	16,296,199	42,576,000
†Illinois	.....	1,711,951	55,405	‡114,808,228	56,750,000

*Agricultural States.
†To a greater or less degree manufacturing States.
‡Nominal value of agricultural products for 1860.

STATES.	Number of scholars attending school	Value of real and personal estate	Assessed average value of land per acre	Manufacturing, mining, and mechanical arts—average number hands employed	Cash value of farm lands, improved and unimproved	Farm lands—cash value per acre
Virginia	41,608	$793,249,681	$10 20	36,590	$371,696,211	$17 60
North Carolina	150,000	358,739,399	3 60	13,890	143,301,065	6 00
South Carolina	19,132	548,138,754	6 70	6,800	139,652,508	8 60
Georgia	77,015	645,895,237	4 80	12,090	157,072,803	5 80
New Hampshire	85,245	156,310,860	9 83	36,100	69,689,761	18 60
Massachusetts	203,031	815,237,433	99 00	216,800	123,255,948	36 40
Rhode Island	25,893	135,337,588	96 25	33,200	19,385,573	37 30
Connecticut	71,269	444,274,114	64 00	65,780	90,830,005	36 20
New York	831,735	1,843,338,517	96 80	221,481	803,343,593	38 20
New Jersey	125,035	467,918,324	32 48	127,720	180,250,338	60 40
Pennsylvania	593,837	1,416,501,818	18 65	223,250	662,050,707	38 90
Delaware	10,230	46,242,181	19 52	6,192	31,426,357	31 20
Maryland	33,111	376,919,944	7 30	40,900	145,973,677	30 00
Illinois	323,393	871,860,282	8 10	24,370	432,531,072	20 00

On entering the Union, the States of Virginia, North Carolina

salubrious but mild climate, cheap but efficient labor, and these withal producing the great staples of commerce, such as rice, cotton, and tobacco. These men said, these advantages cannot fail us, and the controlling influence which we now hold can but continue. But to little purpose had these men read the history of other States and Nations. Did they think that the sun and moon for them would stand still? or that the unalterable laws which secure the prosperity of nations would in their case be turned aside? Fatal hallucination. The history of these States, (Virginia, North Carolina, South Carolina and Georgia,) as compared with those that started at the same time, possessing *few* of those natural advantages which these possessed, is so striking and full of instruction, that to cast it aside would be to neglect the surest means of advancing civilization, defeating the great objects of education, and depriving the many of their ability to obtain those comforts and enjoyments which ever cast a solace over the burdens and cares of life.

We turn from the workings and results of this subject at home to that of some of the nations of Europe. We see there, as here, that the mechanic arts expand, liberalize and elevate a nation. No truer missionaries ever went forth than these. The power of steam which these employ, and which has added so much to their extension and efficiency, rules to a great extent the machinery of nations. And that nation or people that have chained it to their car of progress are those that are bound to rule, for good or ill, those that are less enterprising or favored by nature. Foremost in this work is England. Long since has she learned the power and application of steam in multiplying her manufactures. She has learned that 20 men, by this agent, are equal to 400 without it. Her power looms up when we multiply her population thus employed by the number of her steam engines. England and Wales had employed in the manufacture of textile fabrics, in 1838, 2,600 steam engines. By this enormous power, in its application to her industry, well may she claim to rule the seas, and to hold in her hand the balance-power of nations.

The area of both England and Wales is less than 60,000 square miles, with a (home) population of 19,304,000 (in 1857.) Her cotton mills in 1858, numbered 2,046, employing 341,170 males and females. As far back as 1838, she had working 1,179 woolen mills, 178 of flax, 263 of silk, and 416 in worsted goods.

England, by her great wealth and power thus acquired, has at times appeared to oppress a portion of her people, both at home and abroad. Notwithstanding this accusation, the constitutional rights of her subjects, both there and elsewhere, have been not only maintained, but with the age, progressed. We give her the right hand of fellowship for the asylum which she has failed not to extend to the oppressed or persecuted of every land, whether the subject be exiled royalty or the dark skinned African.

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France, in the extent of her manufactures, ranks next to England. She combines, from the area of her territory, agriculture with her manufactures, to a far greater extent. The area of this territory is 203,736 square miles, with a population, in 1856, of 36,039,364, of whom 10,162,515 are employed in manufactures, mining, and the mechanic arts. In the manufactures of wool, cotton and silk, she has taken a leading part. France deserves to be mentioned for her success and for difficulties overcome, in the manufacture of sugar from the beet. Her manufactures thus employed number 300, producing of sugar 150,000,000 lbs. Her manufactures of flax (linen) number 230.

France has employed, in agriculture, 20,351,000 of her population, yielding an income of $1,700,000,000. The value of her manufactures, aside from the mechanic arts and mining, amounts to more than $400,000,000.

In no country in Europe have manufactures been more rapidly extended, and in none been better appreciated than in Russia. Coupled with the generous and exalted policy of her Emperor, she can but in a few years rival even England and France. The progressive power of steam has nowhere made such progress as here. In 1854, there numbered in the Empire 18,100 manufacturing establishments. Of these, 300 were of cotton, 200 of silk, 500 of wool, and 360 of the sugar beet—more establishments of this (beet) than in any other nation. To show the rapidity of increase in the application of steam, (to manufactures,) there were in the department of Moscow only two steam engines in 1820. In ten years the number had increased to 100. No people during the past quarter of a century are under greater obligations to the power and application of steam than those of Russia. The liberated serfs cry out, and say, it has ransomed their nation.

Have we not something to learn from Russia, in the cultivation and manufacture of the sugar beet? Our soil and climate are equally favorable, and the skill of our artisans not less handy. I believe we may profit by Russia's experiments and success in this branch of her productive industry.

From Russia we turn to Spain. From *her* we can learn a lesson. Although as a nation she possesses many noble traits of character, still her intolerance and blind bigotry drove from her borders her most industrious and skillful artisans, and to-day her barren and uncultivated plains attest the righteous retribution of the unwise if not wicked act. This most fatal step might have been retrieved had her rulers considered that a nation's greatness or prosperity depends not on foreign conquest, on treasures of gold and silver, (else Spain would have been the richest and most prosperous nation of the world,) but on that sure and strong arm of industry, by which commerce is extended and agriculture sustained. In the middle ages the wool and silk tissues of Seville, Grenada and Baeza, the cloths of Mercia, and the arms of Toledo, attest the skill

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of the men that became outcasts to their country. The Spanish race has never exhibited that degree of careful and patient industry possessed by the Moors; hence agriculture and manufactures have never fully recovered since their expulsion. Still Spain shows progress, as the increase in her population will indicate. In 1834, her population was 12,597,719. In 1857, it was 15,464,514. Of artisans and manufacturers Spain has employed 156,055, out of a population in 1857, as above indicated. While France, as you will perceive, out of a population of 36,039,364, has engaged 10,-162,515. Do we wonder at the greatness and power of France? Her (Spain's) progress is further shown, for she had nominally engaged, in 1861, in pursuits of industry, $215,448,500. As the application of steam to the mechanic arts increases, it can but improve the condition of her laboring classes and create for her agriculture and manufactures a more enlightened policy.

If a policy so unwise has for centuries governed Spain, what shall we say of Ireland? Ireland had, in 1858, 6,013,103 in population, and an area of territory equal to 32,508 square miles. Ireland had, in 1841, a population of 8,175,124. The inquiry is made why this great national degeneracy? It is true, during that time, famine invaded her borders, but to this circumstance alone we cannot trace the loss of so large a number of her population. Does not the secret lie in the fatal mistake in not giving encouragement to industry by those having it in charge? Whether the fault rests with the Irish people themselves, or whether on England rests this fearful responsibility, it is not my purpose now to inquire. My sympathy is with the Irish nation, and I only wait yet to see her redeem that nationality for which she has so often struggled.

Her industry and production present the following sad picture. When we read it we hesitate and ask, how does she even *now* maintain her present diminished population? Ireland has but few manufactures. In 1856, she had of flax, (linen) 110; of wool, 27, and of cotton, 12. While Scotland, with a population, in 1861, of but 3,061,251, had, in 1859, of manufactures of flax, (linen) 168; of cotton, 152; of wool, 202; of silk, 6; of paper, 51. In 1841, her population was but 2,620,184. Should we wonder, then, at the prosperity of the one or the unfortunate condition of the other; and yet these are but the workings of that unchanging law, which States or Nations cannot escape.

The subject of home industry has for many centuries, in the Netherlands (Holland) been carried out. Let us see with what results. The history of this country should be studied by every statesman and political economist. Her long course of uninterrupted prosperity cannot be ascribed to the mere caprice of fortune. If three centuries have tested the wisdom of her policy, it should not be lost to us. Occupying as it does but a speck on the map of Europe, it has, during these centuries, maintained a proud nationality, and secured to her citizens great wealth and prosperity.

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Starting with but few natural advantages; possessing, not like Illinois, an abundance of coal to feed her engines, but obliged mostly to depend on the peat dug from her marshes for her fuel—her territory is but small, area 13,890 square miles, and much of this formed by a marsh—we can safely say, "there is no country where nature has done so little and man so much." Her home population was, in 1859, 3,543,775. By her manufactures and commerce she holds and gives laws to more than 16,000,000 of population, principally in the East Indies. Her dikes and canals are the best in Europe, and should put to shame nations of greater pretensions. Her Helder (canal) is so large that frigates can pass in it, with a depth of twenty feet nine inches and fifty miles long. Her manufactories are, of oil, 312; more than 500 of cotton and flax (linen.) There are in the country 600 ship-yards, where a tonnage of 54,636 is annually launched. Her advanced civilization is represented by 7,410 charitable and benevolent associations. Among those for the unfortunate there are 138 asylums; also 40 for employing poor laborers, and 47 for the relief of poor travelers. Truly may it be said of this nation, especially when we call to mind her many struggles for national existence with the most powerful nations of Europe, that prosperity or adversity may in turn be the condition of a people, from causes beyond their control; but those alone that depend on their *own* industry and resources, can bid defiance to the assaults of fortune.

I should have said above that Holland has succeeded in controlling and using the wind as a motive power, beyond other nations. This power is largely used in draining her lands. By this agent the windmills are made to average a discharge of water of 250 tons per minute. What then shall we say of a nation that has even chained the winds to her car of progress?

Farmers of Illinois, are you willing that *your* lands, which should be worth at least from $50 to $100 per acre, shall deteriorate, as in other States, and be worth but from $5 to $10 per acre? Will you be satisfied, when, instead of raising twenty-five bushels of wheat, you can raise but seven bushels, or that your crop of Indian corn, shall, instead of fifty bushels, be reduced to ten? Are you willing to secure a home market, by which a permanent and remunerative price for your home products can be obtained? Or will

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CLASSIFICATION OF SHEEP FOR PRIZE LISTS.

By H. S. Randall, of Cortland Village, New York.

Cortland Village, New York, November 10, 1864.

John P. Reynolds, Esq.,
Corresponding Secretary Illinois State Agricultural Society, Springfield, Ill:

Dear Sir: The proper classification of sheep for a prize list adapted to the present time, had not received my attention until a short period before our recent State Fair. Being invited by the State Agricultural Society to open the "discussion" which you refer to, on that topic, I gave it such brief consideration as I could; but I arrived at no definite conclusion, embracing the whole subject; and, therefore, avowing my unreadiness to submit any complete plan, contented myself with pointing out the inequalities of our existing system, and submitting a few propositions for its amendment. Most of the latter, however, were thrown out, rather for further consideration and discussion, than for definite action. The subsequent debate, I am sorry to say, elicited little further on the subject, it being mainly diverted into a dispute about the pedigrees of American Merinos.

Various circumstances have conspired to render the proper classification of sheep for a prize list matter of much greater difficulty than would be at first apprehended; and the constant changes which are taking place in breeds and varieties, or in the popular estimation of them, require corresponding changes in classification. That of our English breeds has been made comparatively easy by the adoption of English precedents. The English classification rests partly on identity of blood, but more on the existing physical status. It recognizes as a "breed" every variety or sub-variety which breeders adjudge to have become "established," however recent its origin and however mixed its blood. The prevailing mode of producing new varieties, or, as they term them, "breeds," by the Eng-

and at a comparatively recent period, by a mixture of several "breeds;" and it is well known that they are now receiving, and have been receiving for years, occasional fresh infusions of Cotswold blood, for the purpose of improving their constitutions, and their hind quarters, which are inferior to those of the Cotswold sheep. The improved Cotswold, now in general vogue, has been generally, if not universally crossed to a certain extent with the Leicesters, to improve some points of its carcass, and specially to give it earlier maturity. The improved Oxfordshire sheep, so successful in prize taking in England, is the result of a recent direct cross between the Leicester and Cotswold. With the single exception of the South Downs, all the most distinguished English Middle Wooled varieties are crosses between different varieties, and a portion of the most approved of them are *cross-breeds*, not only in the English but in the American sense of the term. The Hampshire, Shropshire, and Oxford Downs, classed as Middle Wools, are all credited with infusions of *Long Wool* blood. If, therefore, a prize list arranges all or most of the previously enumerated kinds of sheep into separate classes, that classification is based on characteristics, not on identity of blood. I see no objection to this, in itself considered, that is, if the society offering the prizes has sufficient funds, and all the breeds, cross-breeds and varieties to which premiums are offered, are really valuable; if each, even to the smallest degree, meets, better than the others, some want of the consumer and producer.

It is very difficult, however, to apply the same rule of classification to the fine-wooled or Merino sheep, and at the same time give no encouragement, where none, relatively speaking, is believed by the great majority of the public to be deserved. Our State Society has at different times offered separate prizes to the Spanish, French, Saxon, and I believe, Silesian Merinos. But the farmers of this State have almost universally condemned the French and Saxons, and but few have yet adopted the Silesians. There certainly are manifold objections, both in theory and practice, to bestowing premiums on *tried and condemned* varieties of stock. For the present, at least, the American (it ought no longer to be called "Spanish"*) Merino is indisputably the most profitable for *general* breeding; and therefore it has, in the popular estimation and in price, thrown all the other Merino varieties into the shade. Accordingly, the last prize list of our State Society made but one class of Merinos, or fine-wooled sheep. All the different Merinos

*The French, Saxon, Silesian, etc. Merinos, all equally descended from the Spanish

were required to compete against each other, on the ground that they possess "identity of blood," and that it is to the best of the same blood or breed alone that premiums should be awarded. Two serious practical objections have been found to this course. The first is that no uniform or even approximately uniform standard of excellence is thus recognized or fostered. The finer wooled Merinos, whose staple is adapted to the manufacture of the finer fabrics, like broadcloth, are required to compete against the heavier and coarser wooled Merinos, whose staple is only adapted to coarser fabrics. You might as well require all English Long Wools and all English Middle Wools to compete each in one class; nay, you might far more consistently do so, for what is the value in the United States of Cotswold, or Hampshire Down, or Shropshire products, for example, compared with the products of either of the above mentioned grades of Merino sheep? And by merging all Merinos in one class, you cannot in reality, merge competition between Merino varieties. If a majority of the viewing committee consider a particular variety of them preferable, they will, of course, if the relative quality of the specimens exhibited is equal, award the premiums to that variety. They would not be honest to their own convictions if they failed to do this. In 1863, nearly all the fine-wool premiums of this State were given to the Silesian Merinos. Indeed, there was scarcely any competition from American Merinos —because the breeders of that variety were not satisfied with the selection of the committee, or in other words, believed that it was composed of men who would give the preference to the finer grades of Merinos. In 1864, on the other hand, the American Merinos won all the premiums where they competed, though the Silesians were as well represented as in 1863. The viewing committee of 1864, frankly declare in their report:

"In making our awards, we have passed over a variety of Fine-wooled Merinos, popularly known as Silesians, except in cases where there was no competition, *because a majority of the committee believed that in the present situation of the wool markets, the American Merinos are most profitable.*"

It is manifest that under such an order of things the real struggle between the different varieties of Merinos must always, necessarily, *be in the committee room, when the judges or viewing committees are appointed—not on the fair grounds between the sheep!* No amount of impartiality on the part of the Executive Committee of the Society can prevent this practical result. The evils resulting from such a system are palpable. The standard of excellence set up by the Society one year, by the action of its viewing committee, is overthrown the next. This constant oscillation would soon destroy all healthful competition. Or if the Society appointed judges of the same preferences every year, all varieties but the preferred one would be driven from the field, and the Society

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would subject itself to imputations of manifest partiality, or of attempting improperly to coerce public opinion.

There is another objection to the system. If the English sheep are divided into half a dozen or more classes, and if the Merinos are all included in one, it results that far more money is offered in premiums to the former than to the latter. This was actually the case in our New York State Society this year. That the English sheep are exceedingly valuable; that in many situations they are more profitable than Merinos; that they meet special wants of a class of producers and consumers which the Merino cannot as well meet, is freely conceded; but I need not say that the consumption of their products in our country bears but a small comparison to the consumption of the products of the Merino—and consequently that they are, in the aggregate, far less numerous and less valuable. Is there not, then, a great inconsistency in giving them the first place in our prize lists, and in offering them a greater amount of premiums? This might be obviated by paying higher premiums to the Merinos, or by offering double the usual number to animals of each respective age; but while neither of these courses is free from grave objections even to meet the special end in view, they would do nothing to remove the essential inequality of compelling all Merinos to compete in a single class.

The Executive Committee of our State Agricultural Society—composed of able, experienced and impartial men, having tried the above system, experimentally, and found it, I suppose, unsatisfactory, instituted the "discussion" at Rochester, which has been so ludicrously travestied by certain reporters.

I attempted to show in that discussion that French, Saxon, and other Merinos constituted as distinct varieties, as most of the English ones which the Society recognized in its prize list, but for the reasons already given, I did *not* recommend their arrangement into separate prize classes. I also attempted to show that the different Spanish Cabanas had been kept longer separate and distinct from each other than the different varieties of either the English Long or Middle Wooled breeds, and hence that it was, in itself considered, as proper to give them separate places in a prize list as the former. I declared that one of those Cabanas, believed to be the Infantado, exists pure in the United States; that another, the Paular, though it has received some dips from the blood of other Cabanas, to effect certain improvements, has maintained its character as a separate variety; that the so-called Silesian sheep, composed of a cross between the Negretti and Infantado Cabanas, constitute a third well

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it is at least apparent that they now constitute quite as unrelated varieties as the much crossed English ones, and that I am correct in that belief, I am willing to attempt to prove on any suitable occasion. I considered them also as distinct in characteristics. I did not however, definitely propose to form them into prize classes, for I saw great obstacles in the way of this, growing out of prejudices, interests, and the real difficulty in the case of many excellent flocks of ascertaining how far they partook of the blood of the different varieties—their owners having bred without any reference to the distinction between the Infantado and Paular. I satisfied myself with showing that it would be as consistent and proper, in itself, to classify our Merinos thus, as to adhere to the present classification of English sheep, and I threw out the facts, for further investigation, without committing myself to any ultimate conclusion.

I made one definite recommendation, however, that at least the Merinos be divided into two classes, having reference to the fineness of their wool. As the viewing committee on Merinos at our State Fair subsequently made the same recommendation in their report, I will give it in their own words. After announcing the basis of their decision as between the American and the Silesian Merinos, in the words I have already quoted, they continue: "But we are aware that the demand for the finer Merino wool in our country is much larger than the production, and will continue to increase*; and we therefore respectfully propose that hereafter premiums be paid to sheep in a separate class, producing wool of quality fine enough for the production of our finest woolen fabrics."

There may appear to be a vagueness about this proposed classification, which will render it difficult to carry it out in practice. But the distinction is already well understood in commerce. Every wool circular and list of prices includes "Saxony" and "full blood Merino" wools. These terms are conventional and inaccurate, but they express the precise distinction which it is proposed to recognize in our prize lists. If viewing committees are at fault in making the distinction, let them have the aid of a manufacturer, or wool stapler, or experienced wool buyer among their number, and the difficulty will at once disappear.

You ask me to suggest changes or additions in the classification of the Illinois State Society as may seem desirable. If your Society contemplates no more extensive classification than the present one, I propose that it strike out the third class (French Merinos) and insert in the place of it, "Merinos bearing wool adapted to the manufacture of broadcloths and other finer fabrics." In the fourth class I would strike out the word "Spanish," and in the

*It must continue to increase so long as the public debt and expenditures demand a high revenue tariff like the present. And there can be but little doubt that our broadcloth manufactures will revive, under the same circumstances, greatly increasing the demand.

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place of it insert "American." And I would exactly transpose the order of the above four classes, placing the American Merino first, according to its relative importance. This will form a simple and consistent classification—based partly on blood and partly on characteristics—and with equal premiums in each class it will give equal encouragement to the fine and coarse wooled races of sheep. In your remaining classes and sub-classes I have no changes to propose.

But if your Society desires to increase its number of sheep classes, you have, in respect to the coarse wooled varieties, the English mode of dividing them already prepared to your hand; and then, to be fair and consistent, you must increase your fine wool classes and premiums proportionably, by some principle of classification which has been adverted to, or is yet to be devised. I confess that I am still unprepared to express a final opinion on the subject.

Absence from home and illness have prevented me from replying earlier to your letter.

I remain yours, very truly,

HENRY S. RANDALL.

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ON MARKET GARDENING.

STATEMEMT OF S. W. ARNOLD, OF HIS MARKET GARDEN, NEAR CORTLAND, DEKALB COUNTY, ILLINOIS, 1868.

The piece of land originally set apart for a family vegetable garden, contains one-half acre, on land adjoining the house yards, and gently sloping to the south. It is surrounded on three sides by orchard trees, interspersed with shrubs and plants bearing the small fruits, currants, gooseberries, raspberries, blackberries, etc. The orchard, including the garden spot, contains two acres, is protected on the west by two thick rows of locust trees, on the south by a row of Lombardy poplars set four years ago, eight inches apart, now fifteen to eighteen feet high, on the east by a very thick Osage Orange hedge, and on the north by the yards and buildings of the farm. Of the half acre devoted to garden vegetables, ten square rods were planted with

ONIONS.

Mostly old bulbs and seeds of the top onion. A few black seeds were sown for family use, they producing onions of much the best quality for winter use. The land for these was plowed in the autumn, and the bulbs set very early, before the frost had entirely left the ground, in rows eighteen inches apart and six inches between the bulbs, hoed several times; and marketed during the spring and summer in bunches, beginning when they were about the size of walnuts, the last being two or more inches in diameter. From eight to fifteen were tied in each bunch, with rye straw moistened, sold for five cents each. About two bushels of the black seed onions were harvested for family use. The Danvers Yellow is as good as any sort to raise for early onions. The large red from black seed are good, and keep well. Two rows of bulbs were set during the warm weather in January and covered with straw, which proved a failure, although I have had them do well from bulbs left in the ground where they grew, through the winter, without protection. Ten square rods were devoted to

SPINACH.

This was sown as early as the ground would permit, and at intervals of a fortnight through the spring, for a succession. Tied in large bunches, six inches in diameter, and sold for five cents

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each—the least profitable of any vegetables sold by the bunch—was scarcely known in our markets until introduced by me. Nothing less than very rich ground and high cultivation will produce good Spinach, as its excellence consists in the tenderness and succulence of its leaves.

Ten square rods were devoted to

BEETS,

all intended to be the early Blood Turnip variety, but having to depend on seedsmen for my seeds, only a small proportion of them were genuine. The rest were of almost every variety of form and color. Sown at three different times, for succession, and pulled as soon as they attained the size of a hen's egg and larger, five and six in a bunch, sold for five cents. Planted in rows one foot apart, and thinned to four inches in the row.

Ten square rods were devoted to

RADISHES.

The small turnip radish was mostly raised: are of very good quality, very early, and will bear very thick planting. The London long scarlet radish is used for a later sort, is of good quality and very long, sometimes growing six inches of its length out of the ground. Sown early and late, at intervals of one week, for succession; twelve to twenty tied in a bunch, and sold for five cents—the most profitable of all vegetables for market. They do best on rich land, but with plenty of water will grow very well on ordinary soil.

Ten square rods were devoted to

EALY TURNIPS,

of which the White Flat Dutch is the earliest and best variety, growing very quick, has a smooth white skin, and is sweet and tender—very good for the early fall crop. Sown in drills one foot apart, and thinned to six inches. Pulled when as large as teacups, and sold in bunches of five and six, at five cents each.

Twenty square rods were devoted to

EARLY CABBAGE,

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inches high, into open ground, six inches apart; each alternate plant is pulled out when fit for the table, and the remainder left to head. Those are saved for seed which form the best heads and show the most tardy disposition to seed. A new sort sent out by the patent office last year promises well. Pulled for sale when about four inches high; tied into bunches two inches in diameter, when headed two and three heads tied together for a bunch, and sold for five cents. To raise fine lettuce, requires very rich and well cultivated land, plenty of water, and the highest skill of the gardener. It is truly a delicious vegetable when grown in perfection. When old the juice partakes of the qualities of opium. It should be gathered just before being brought to the table, the outside leaves rejected, rinsed well in cold water, and dressed with one tablespoonful of sharp vinegar and the same quantity of loaf sugar for a small mess.

Two square rods were devoted to

TOBACCO PLANTS.

These were sown on nicely prepared soil, (without burning, as recommended.) Sown in March, and covered by patting with a hoe, and a very thin covering of straw spread over, held on by a few locust brush. The seed germinated very finely, and had the season been favorable for setting, would have yielded a good profit. About ten dollars' worth were sold, at one and a half dollars per thousand, and two acres set on my own farm. A few plants were also raised in hot-bed, and sold in small lots at twenty-five cents to one dollar per hundred. For field culture I much prefer the plants raised in open ground. They can be raised quite early enough, bear transplanting better, and show less inclination to run to seed.

Two square rods were devoted to

HOT-BEDS,

made at different times, from the 25th of March to the first of May. After that cold frames are used. The hot-beds are made by excavating about fifteen inches, throwing the top soil on one side and the bottom soil on the other side, to be used in banking up. This excavation is filled to a little above the surface with fresh horse manure, coarse and fine mixed together—the later in the season the greater proportion of coarse manure. Frames are put on, and the manure covered with six inches of good soil, a goodly portion of old hot-bed soil and manure being mixed with it, and all sifted through a wheat sieve, which makes a fine, mellow bed for the roots of the young plants. The hot-beds are filled, emptied and re-filled several times during the season, with cabbage, lettuce, tomato, egg-plant, pepper, and other plants. The most important being early cabbage and tomato. Each of these is sown quite thick, and when three or four leaves are formed, the

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plants are transplanted or pricked out into new beds, and lastly into cold frames, before the final transplanting into the open ground. The secret (if it be a secret) of getting fine and early plants is, plenty of room and water, and frequent transplantings. The frames are covered with glazed sash, which are shut, partially opened, or entirely removed, to suit the temperature of the atmosphere.

The remainder of the half acre was occupied with miscellaneous plants, some for use and some for seed.

SECOND CROPS.

The Spinach land was planted with water melons, as was part of the radish ground, spaces being pulled for the hills before all the crop was harvested. They ripened before the September frosts, and yielded very well, considering the dry summer. The space planted with early onions was set with winter cabbage, or Flat Dutch, there being ample time after the onions were harvested. They did exceedingly well, and three hundred heads were sold for five dollars per hundred. After the water melons were taken off from the ground previously occupied with spinach, it was spaded and planted with Tulip and other bulbs for spring flowers.

ASPARAGUS.

The old bed made five years ago occupies about seven square rods, was deeply trenched and well manured before setting, and has yearly a small dressing of old manure in the fall, and a thorough harrowing with two horses and two men to ride on the harrow, stirring the surface several inches deep, and mixing in the manure in the spring. Afterwards it is hoed to keep down the weeds. Sold in bunches as large as one hand can span, for five cents.

The new bed, made one year ago last June, contains twenty square rods, being a strip between two rows of small orchard trees; was prepared by covering six inches deep with strong barn-yard manure, plowed three times in each furrow with a strong team, equal to about twelve inches in depth. The furrow was then cleaned of the loose dirt and spaded to the depth of eleven inches. After this the manure was hauled in, clearing sufficient space for the next furrow, and so on till the piece was finished. It was then back-furrowed to level it, dragged and rolled, and the seed planted in rows two feet apart, and one foot between the hills. This bed made a fine growth of tops this year, and I presume will produce a small crop next season.

RHUBARB

Is planted three to four feet apart, between two and three hundred plants, on deeply trenched land; is mulched with coarse manure in June or July, so thickly that nothing else can grow; in the spring dug over with the spade, raked off and hoed once or twice before

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mulching time. Yields enormously. Sold in bunches from one to three cents per pound. Varieties: Cahom's mammoth—very large but rather coarse and acid; Victoria—very fine long stalks, beautiful red near the bottom, as good as the best; Strawberry—small long stalks, light green speckled with brown specks, very prolific and good.

STRAWBERRIES,

twenty square rows; Hovey & Willson's; second crop on the land without cultivation; this year almost a failure on account of dry weather; half an acre set one year ago last fall gives promise of a fine crop next season; planted in drills three feet apart, to allow working with a horse. Hovey's is much the best berry, and, under favorable circumstances, about as productive as the Willson's. Only a few sold, at fifteen cents per quart.

RASPBERRIES,

occupy about three-fourths of an acre, only about one-third of which was in bearing last season; variety, Black Cap; set in rows four feet apart and cultivated with horse and cultivator; sometimes mulched; old brush cut out every fall or spring and new branches shortened one half; grow luxuriantly and bear abundantly; give as much profit and satisfaction as any fruit grown on the farm; family and visitors abundantly supplied; many dried and many sold; very much in demand at fifteen cents per quart. Tin oyster cans with one end taken out make very convenient vessels in which to take them and strawberries to market, holding just a quart, make snug storage and save handling. A few red and yellow raspberries are raised for home consumption.

BLACKBERRIES.

Common black and white have been tried in rich cultivated ground, with very little success. A few dozen of the Lawton planted on the east side of a thick row of locust trees, and otherwise shaded, bore a good quantity of fine, large berries last season, and made new shoots twelve feet high and one and a quarter inches in diameter.

CURRANTS AND GOOSEBERRIES

are quite extensively cultivated. The Houghton gooseberry is considered the only sort worth cultivating; the large English sorts all mildew. Red Dutch and White Grape currants are the best standard sorts, and the Black Naples for jellies, and all three for wine, for which purpose most of my crop is used. A few quarts of the finest sold at four cents and five cents per quart, and wine sells readily at $2 per gallon when one year old. The Red Grape currant is large and beautiful, but unproductive.

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PEARS AND APPLES

are yet in quite limited supply for home use. A few Bartletts were sold at five cents each.

PEAS.

One acre was occupied with peas; one-half planted with Early Kent and Dan. O'Rouke, which yielded bountifully; ground plowed in spring, and had been lightly manured in previous years; sowed in drills two and a half feet apart; worked twice with cultivator; neither hoed nor brushed; fit for market by 15th of June; first sold for fifty cents per peck; mostly sold for twenty-five cents per peck. The later sorts planted were Black-eyed Marrowfat and Champion of England, both good and profitable sorts; sold mostly at twenty-five cents per peck—a few sold as low as fifteen cents per peck; plenty of seed was saved of all kinds, and a considerable quantity fed to hogs with the vines. A few Tom Thumb peas were planted for experiment, and found to be much earlier than Early Kent. The vines are so small they may be planted very thick, and cultivated with the hoe alone; worthy of further trial for the earliest crop. After harvesting the early peas forty square rods, the ground was plowed, dragged, and sown immediately with flat turnips, yielding about 120 bushels, and worth about $40. The weather was very dry at the time of sowing, and I attribute the good success in germinating the seed to sowing immediately on the newly turned furrows.

BEANS.

Only a few early beans were planted, and a portion of them failed to germinate; string beans sold at five cents per quart. About one-fourth of an acre of white field beans were planted in the orchard, in drills four feet apart; several bushels were gathered while green and the remainder threshed, yielding three bushels; one bushel sold for $2 50 cash.

SWEET CORN.

Only one-half acre was planted; variety, Periam's Early, and a large, late sort from Rhode Island, called Asylum corn, having originated at the Dexter Asylum, in Providence, Rhode Island. Both very fine. Sold mostly at ten cents per dozen.

EARLY CORN.

One-fourth of an acre was planted with an early flint white corn of very dwarf habit, and Early Darling from Periam; both good

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Winter squashes, cucumbers and melons, all a partial failure on account of dry weather. Vines of all kinds need an abundance of water, with rich land, for their full development. I have tried excavating a hole two feet square and one foot and a half deep, filling in a foot of fresh horse manure and a foot of earth on top, making a hot-bed for each hill; and although they grew well at first, they are sure to die prematurely for want of water. Plants raised in pots in hot-bed and turned out into a cold frame of four lights, without disturbing the roots, succeed best with me for early crop. The Hubbard is the best of all winter squashes, but a very shy bearer. The Early Russian the best cucumber for pickles.

SWEET POTATOES.

One barrel were bedded in hot-bed about the middle of April; some rotted; plants were sold to the amount of $18, and one-fourth of an acre set on ridges, turned with the plow, two furrows together; land unmanured; southern aspect; crop nearly a failure for want of rain; would recommend plowing the land early in spring, and harrowing well before making the ridges; ridges three feet apart and plants fifteen inches apart, is the proper distance; very rich land makes a rank growth of vines without a proportionate increase of tubers.

POTATOES.

Three acres were planted; one-half Early Yorks, the balance with Mexican, Early June and Neshannocks. The first is the most valuable of any early potato with which I am acquainted, is good for the winter crop, and their early ripening renders them less liable to rot; ground plowed in autumn and again in spring as soon as practicable; dragged and rolled; marked two and a half feet each way; and one piece, containing two eyes, dropped in each hill; for early crop shallow planting is best, and for the very earliest, one-half of a large potato or a medium sized whole one will produce stronger shoots at first and earlier potatoes than the small pieces, but are no better for the later crop. The small quantity of seed in a hill produces a greater proportion of large potatoes, and the thick planting makes up the quantity of bushels. Commenced digging 18th of June. Sold at first for fifty cents per peck, but mostly at twenty-five cents per peck; all sold before the middle of August.

ORNAMENTAL.

About $25 worth of ornamental shrubs, roots and flowers in pots, were sold during the season. The ornamental flower plat belonging to the homestead contains about ten square rods, and what was sold was mostly the natural increase, no especial pains being taken to propagate.

The vegetables were mostly marketed in Sycamore, the county seat of DeKalb county, a few being sold in KeKalb and Cortland.

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Team, two light horses, a light spring wagon; three trips per week; amount of money received during the season for vegetables, etc., $525 67. The cost of cultivating it is impossible to tell. Gardening not being a specialty, it was cultivated only as a collateral branch of the system called "mixed farming," and being considered the most profitable branch, will hereafter be considerably enlarged. The force required to carry on the operations of the 160 acre farm and garden is four boys, between ten and twenty years of age, one hired man, myself and two teams, one for the marketing.

Location—Town of Pierce, DeKalb county, Illinois.

Quantity of Land—About seven acres.

Land—High, rolling prairie, not artificially drained.

Manures—Barn-yard and horse manure applied in winter and spring and plowed in; made on the farm; on potato ground no manure; on pea and corn ground twenty loads per acre; on garden proper, an unlimited quantity, applied every year.

S. W. ARNOLD.

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ON ORCHARDING.

Statement of LUCIUS C. FRANCIS, Town of Clear Lake, Sangamon County.

The orchard entered by me for a premium is located in Clear Lake township, Sangamon county, and contains between fifteen and sixteen acres. We have about fifty varieties, most of them in bearing. Though we have a number of varieties, we have but few fall apple trees in the orchard, as we find that very early summer apples and good keeping winter apples are more profitable. We have growing the following varieties:

SUMMER.—Early Harvest, Red Astrachan, Benoni, Summer Queen, Early Strawberry.

The Early Harvest and Red Astrachan are our most profitable early apples; we have about eighty trees of the former and some twenty of the latter.

FALL.—Maiden's Blush, St. Lawrence, Sangamon Red Streak, (a superb apple,) Gravenstein, Porter, Rambo, Fameuse, Fall Russett, Blue Pearmain, Early Sweet Bough, Jersey Sweet, Summer Sweet Paradise, Munson Sweet, Golden Sweet.

WINTER.—Jennetting, Northern Spy, Prior's Red, Peck's Pleasant, Esopus Spitzenberg, Newtown Pippin, Lady Apple, Wine Sap, Swaar, Talman's Sweet, Yellow Bellflower.

The most of the orchard is taken up with these varieties of winter apples. We have also the following varieties growing; from one to three or four trees of each: Big Romanite, Little Romanite, Yellow Sweet, Baldwin, Smith's Cider, Hubbartson Nonesuch, Jewett's Fine Red, Norton's Melon, Rhode Island Greening, Vandevere, English Russett, Wagner.

The past season has not been a good fruit season. The apple

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ground had been cropped with corn a number of years. In setting the trees holes were dug four feet in diameter, the first spade depth thrown out, the next left in the hole. About 75 trees were planted in the spring of 1852, 175 in '53, about 50 in '54. Dead ones were replaced every succeeding spring or fall. About 250 were planted in '58, 50 in '59, 150 in the spring of '60, and 10 last fall. Thirty feet apart is the distance all our trees are planted. The orchard has been cropped with corn for several years, only one crop of oats was raised, as we think small grain is injurious to trees. In breaking up the orchard in the spring, the first two furrows with a single horse and a large corn plow, with a stretcher; the chain on one side wound with cloth to prevent barking the trunk; the top of the hames of the harness cut off to prevent barking the limbs, as we prefer as low-headed as we can work under. We never trust a hired man to run these furrows, but do it ourselves. After they are plowed the two-horse plow is used. The dirt was thrown to the trees until the ground was sufficiently ridged to run the water off well. For several years we examined the trees in the spring and fall, as the borers were very troublesome; now the orchard is very free from them. Once a year is sufficient. We prune our trees in September and October, would prefer July, but have not time to attend to it then. We scrape the trunks in the spring and wash with strong soap suds. We never suffer vacancies to remain in the orchard, but replace in the fall when convenient, or in the winter when sufficiently frozen to take up a large ball of earth with the roots. We have for a number of years past raised our own trees, and find that good, thrifty seedlings, top-grafted, are far more hardy and come into bearing earlier than root-grafted trees.

In the winter of '55 and 6 our Jennettings and Baldwins (root-grafted) suffered severely, while the top-grafted trees of the same varieties were uninjured.

Late bearing varieties also come into bearing much earlier by being top-grafted, which we have frequently proved by sowing seed and setting out trees purchased from the nursery the same season, working the seedlings from the nursery trees and raising fruit from them as soon, and in some cases sooner, than from the root-grafted trees of the nursery.

Nothing to us, in the orchard, looks more slovenly than to see trees leaning, some with their tops resting on the ground, others inclining at all angles, almost invariably in the same direction, (to the northeast) looking as if a tornado had been through the orchard; consequently, we have been very careful to keep our trees upright, which we do, while the trees are young, by banking up against the leaning side, pressing firmly with the foot. Some trees would still incline, and as props would be in the way while cultivating the orchard, we permitted them to remain so until we seeded down to grass. Then providing heavy poles or posts, six to eight

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feet long, a stout rope, some old cloths, a spade and axe, two or three of us would go out to right up the refractory trees. By tying the rope up in the top, and in some cases digging about and cutting the roots, two, by pulling at the rope, could pull the tree straight. Previous to this, the end of the prop next to the tree had been hollowed out a little and rounded to fit the tree, a hole dug on the leaning side of the tree sufficient to hold the foot of the prop, and at such distance from the tree that when the prop was set the tree would lean slightly in the opposite direction. Trees that will not yield to this treatment we back the wagon up to, hitch the rope to the hind axle, while one gets the prop in its place ready to put under a limb, another takes the lines, starts the team, (which must pull true and steady,) the tree is swung over and the prop slipped under the limb. The old rags are used to prevent barking the trees. Two or three thicknesses should be wrapped where the rope is tied; also between the prop and the tree.

Our orchard has been in grass four years, during which time we have manured generously to compensate for the heavy crops of hay taken from it. Last fall we broke it up, and intend sowing to buckwheat, as we think an orchard needs frequent cultivating to keep it in good order, and to produce large crops of good sized fruit. The orchard is inclosed by an Osage Orange hedge, which has been permitted to grow for several years without trimming, that it may answer as a protection from high winds.

We gather our winter apples early, before severe frosts, pick in baskets, empty carefully into clean barrels, either head up immediately or lay the heads on loosely. We practice both; are undecided which is the best, (they appear to keep fully as well when headed immediately as when permitted to go through the sweat previous, though they come out of the barrels so covered with moisture as, in some cases, to make it necessary to wipe them before taking to market,) take to an open shed (on the north side of a building preferred) placed so that the air will circulate between them freely, let them remain till there is danger of freezing. Apples headed up will bear a temperature of several degrees below freezing without injury; then remove carefully to the cellar, heading up those not previously headed, laying the barrels down some six or eight inches from the cellar bottom, and piling up as high as convenient; have windows and doors, so as to have plenty of air when necessary. We have a thermometer in the cellar, and keep the temperature as near freezing as possible and not endanger potatoes, as the latter will freeze at a higher temperature than apples. We would prefer, and intend to have, the apple part of the cellar separate from the other, with a temperature of six below freezing, though, with our present arrangement, we have kept the Fameuse or Snow Apple in good order until the middle of March, and other apples in proportion.

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HENDERSON COUNTY.*

The Henderson County Agricultural Society was organized ten years ago, and has held annual fairs on the grounds, at Oquawka, leased by the society. During the war it was not to be expected that much interest would be taken in the annual exhibitions. It was deemed best, however, to keep up an organization and be ready, on the return of peace, for more active operations.

The tenth annual fair was held on the 21st, 22d and 23d days of September, 1865, and was entirely successful. The weather was magnificent, the grounds in good order, and the attendance large. The Burlington Brass Band had been engaged, and treated visitors to most excellent music. In many departments the exhibition was greatly superior to the fairs of former years. The display of horses, in the various classes, was particularly fine, and elicited the admiration of all who were present. The show of cattle and hogs was not what it should have been—our farmers can and will do better hereafter.

The display of farm and garden products was the best we ever had, and would have done credit to our State Fair. The samples of wheat, corn, potatoes, onions, sorghum, broom-corn, squashes, etc., would be hard to excel anywhere. The show of fruits was not large—the crop being light—but some fine varieties were exhibited. The ladies' departments fell short of what was expected, but our "maids and matrons" will, doubtless, exert themselves next year for a better display of their handiwork. The exhibition in the mechanical department was quite fair.

A large and choice assortment of woolen goods, consisting of cassimeres, satinets, plaids, blankets, yarns, etc., manufactured and exhibited by Messrs. J. W. Hopper & Co., of Hopper's Mills, Henderson county, attracted great attention. On the second and third days the trotting and pacing came off, and was spirited and lively. Two lady equestriennes competed for prizes, and showed evidence of skill and practice.

On the whole, the officers of the society felt proud of the result and well repaid for their labors. The unusual interest and spirit manifested by our citizens at this fair, indicates that their hearts are in the work, and that hereafter our exhibitions will be looked

*Report received too late for insertion in regular order.—SECRETARY.

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forward to with keen anticipations of pleasure and profit. It is contemplated by the society to purchase more commodious grounds, erect new buildings, and generally to increase the facilities and accommodations for holding fairs. Our motto now is, ONWARD. We are determined to spare no efforts to advance the interests which agricultural societies were intended to foster and encourage. Our county is rich in soil, well watered and timbered, within easy access by river and rail of good markets, and with her resources rapidly developing, must soon take rank among the first agricultural counties in our noble prairie State. We confidently hope, therefore, that our annual fairs and our agricultural society will soon become the pride and honor of Henderson county.

The officers elected for the ensuing year are as follows:

President—E. Hollingsworth.

Vice Presidents—H. L. Thomson, Sam'l Hutchison.

Secretary—Harry F. McAllister.

Treasurer and Corresponding Secretary—Robt. S. McAllister.

Executive Committee—John M. Fuller, E. H. N. Patterson, M. H. Jamison, O. W. Milliken and Sam'l McElhinney.

Very respectfully,

R. S. McALLISTER,

Corresponding Secretary.

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TRANSACTIONS

OF THE

ILLINOIS STATE HORTICULTURAL SOCIETY,

EMBRACING SELECTED PAPERS, ESSAYS, REPORTS, LISTS OF FRUITS, USEFUL AND ORNAMENTAL TREES AND SHRUBS, RECOMMENDED BY THE SOCIETY,

FOR 1861, 1862 AND 1863, WITH THE PROCEEDINGS ENTIRE FOR 1864.

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OFFICERS FOR 1862.

PRESIDENT.

O. B. GALUSHA, Lisbon, Kendall County.

VICE PRESIDENTS.

1st District—	C. D. Bragdon	Chicago, Cook County.
2nd "	Robert Douglas	Waukegan, Lake County.
3rd "	O. H. Robenstein	Freeport, Stephenson County.
4th "	J. H. Stewart	Quincy, Adams County.
5th "	A. Bryant, Jr.	Princeton, Bureau County.
6th "	J. F. Nash	Ottawa, La Salle County.
7th "	M. L. Dunlap	Champaign, Champaign County.
8th "	K. H. Fell	Bloomington, McLean County.
9th "	N. Overman	Canton, Fulton County.
10th "	Jonathan Huggins	Woodburn, Macoupin County.
11th "	Chas. Kennicott	Sandoval, Marion County.
12th "	Jas. E. Starr	Alton, Madison County.
13th "	G. H. Baker	Cobden, Union County.

CORRESPONDING SECRETARY.

C. T. Chase ..... Chicago, Cook County.

RECORDING SECRETARY.

W. C. Flagg ..... Moro, Madison County.

ASSISTANT SECRETARY.

J. T. Little ..... Dixon, Lee County.

TREASURER.

S. G. Minkler ..... Specie Grove, Kendall County.

EXECUTIVE BOARD.

O. B. Galusha. Robert Douglas. M. L. Dunlap. James E. Starr.
C. T. Chase.

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TRANSACTIONS

AT THE

ANNUAL MEETING AT CHICAGO,

DECEMBER 3, 4, 5 AND 6, 1861.

The Illinois State Horticultural Society met at Bryan Hall, Chicago, December 3rd, 1861. President, Dr. JOHN A. KENNICOTT, in the Chair. W. C. FLAGG was elected Secretary *pro tem.*

The Committee on Programme reported, and the report was adopted.

C. D. Bragdon, President of the Chicago Gardeners' Society, made the following Address of Greeting:

Mr. President, and Gentlemen of the Illinois State Horticultural Society:

A talented woman once wrote: "What is *done* interests me more than what is *thought* or supposed. Every fact is impure, but every fact contains in it the juices of life. Every fact is a clod from which may grow an amaranth or a palm."

May I not greet you, sir, and gentlemen, as representatives of a class to which this woman, by her confession, belonged—a class who read romance in reality, philosophy and poetry in fact, and the record of truth in all things—who revel in the wonderful disclosures which follow the study of history and natural law, reap rich harvests of pure enjoyments in the peaceful pursuits to which you are so devoted—who, to use a hackneyed couplet,

> "Find tongues in trees, books in the running brooks,
> Sermons in stones, and good in everything."

May I not welcome you to our city, and to our hospitalities, as diligent searchers after truth? For truth, like nature, is permanent, is enduring. And I may add, pertinently, I trust, that this search for truth is the work of this life—the Alpha and Omega of our mission here.

It is to be sought out and adopted, searched for as for hidden treasure, and with a zeal corresponding to that with which we follow after comparative dross.

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Truth is worthy the labor mankind expend in finding it. It is omnipotent and omnipresent. It is everywhere in nature, and as powerful as it is constant in the exercise of its power. It surrounds us, moulds our life, controls our existence—is material to our existence.

Truth is sweet, palatable, profitable—always sweet to the honest man, palatable to the upright, and profitable to all men. It is beautiful, too. Shaftsbury wrote a great truth when he wrote, "The most natural beauty in the world is honesty and moral truth." And he might have added—all truth is beautiful.

Again, I say, it is to be sought for everywhere and by everybody. No one is released from the responsibility of this work in life, for it is the test by which we fix the standard value of all things and theories, physical substances, and metaphysical nonentities.

Every bud that bursts, every tiny grass blade that springs from the rested and winter-nourished earth, every pebble and every dew-drop, every germ of a new life, is a truth, and involves a multitude of other truths in its existence.

Causabon says: "The study of the truth is perpetually joined with a love of virtue, for there is no virtue which derives not its original from truth. Truth is the foundation of all knowledge, and the cement of all society." Its study, therefore, involves virtue and begets knowledge; it is something to do to secure it and adopt it. We are to seek it for its own sake—seek it for the good it may do us—seek it for the power it will give us to do good to others—seek it everywhere and constantly.

Colton says: "Pure truth, like pure gold, has been found unfit for circulation, because men have found it far more convenient to adulterate the truth than to refine themselves. They will not advance their minds to the standard, therefore they lower the standard to their minds."

This may be true of the *language* of truth abstractly, and Colton's words will be appreciated by such of you as have much commerce with men; but it will be found that the great natural truths which underlie success in all the departments of human life, directly dependent upon them, must become current; not only so, but so familiar to us all that we shall be able to detect the genuine from the counterfeit, and reject the adulterated.

Something must be done to obtain this result. We are all convinced of it. We have ample experience teaching us the fact. Our interests demand it. We feel the pressure of circumstances, circumstances which we have not the power to control, daily. We have not the *power*, because we have not the knowledge which gives the power. We submit *perforce* to circumstances, and how *tamely* do we submit? Where is our patient, persistent effort to dig up the truth, or class of truths, that shall bring to us relief?

We have enemies, open and secret enemies. They prey upon us, destroy our substance, neutralize our labor, dishearten and dis-

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arm us! Why? Because we do not know them, do not know the truths which illumine the laws that govern them, which disclose to us the guise in which they come to torment us, and the character of their weapons.

How shall we meet them, and what must be the order of battle? What the mode of attack, and what will be the result of a victory on either side? It is plain, if we study our own interests, that the causes which contribute to our adversity must be sought out and removed. The incidental growth of weeds and hedgerows in the way of our progress must be hewn down and uprooted. We have friends, open and secret friends, known and unknown, appreciated and unappreciated; friends who labor for us, promote our interests, minister to our comfort, and aid in the supply of our wants. They often come in disguise, and we too often repel them. They are a good providence to us. They prey upon our enemies, and surround and defend us from them. They linger about the homestead, and in the orchard, garden and field they labor for us. They are active ministers to our comfort, faithful and true agents. It is important we should know them. It is imperative that we learn to distinguish our friends from our enemies. The search for truth involves the acquisition of this knowledge. And I do not underestimate any man's knowledge when I aver that only the a, b, c, of the truths that affect our life and prosperity, as a producing people, have been learned.

This, then, I think, is the character of the work before us—the *intent* that has gathered us together.

In behalf, therefore, of the Society I have the honor to represent, and the lovers of horticultural truth in this city, and as co-laborers, miners, delvers after truth, I give you good greeting, and a right cordial welcome to Chicago.

PRESIDENT KENNICOTT'S ADDRESS.

Gentlemen of the Illinois State Horticultural Society:

I am glad to meet so many of you once more. You, who have come far, I welcome on behalf of the citizens of Chicago—those who meet with us for the first time, I greet, in the name of our Association. We are here, not so much for our own pleasure and profit, as the good of the entire rural population of the State, and the whole Northwest, in the settlement of questionable points in horticultural practice, and the suppression of popular error, and the dissemination of fixed and reliable horticultural principles and procedure, suited to every locality, and every circumstance, so as occacasion shall indicate them, and time permit us to investigate and decide.

In the regular performance of this self-imposed duty, we must all take a part. There is no man here, who may not have some

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fact, or bit of experience, worth more, to all of us, than the longest and best worded professional treatise—with *nothing new* in it. The readiest writers, and greatest talkers, are not always the closest and most reliable observers. We want *facts*—and all the circumstances connected with them—not wordy deductions, or windy notions. WE *must not* "jump at conclusions," and above all, we must not attempt to grind our own particular professional axes at this meeting.

And now, for my parting advice to you, and the whole brotherhood of rural and mechanical labor. Since the first politician beguiled the first "gardener," the cunning tongue of his progeny, and the strong wills of despots, have been ever too powerful for the sons of honest labor—"the bone and sinew," as we are conventionally termed—*just before every election*. For, when the lion's skin has proved too short, it has always been eked out with the fox's hide. And we who saw the cheat have still submitted, for the sake of peace and quiet, and because we knew, that of every twenty farmers nineteen *would* be humbugged, say what we might.

It has been said that "the pen is mightier than the sword." I question not the adage, but mightier than every other instrument is the *tongue* in this free country. WORDS, deftly spoken, whether true or false, are the engines that move the masses. We are but animated puppets—our votes are bought and sold in the political market—with advantage to both seller and buyer—but we get only *words* in payment.

I *advise*, then, that you imitate, not my *practice*, but heed what I now tell you. Let your children be taught *words* as well as things! and above all, teach them self-reliance; and let them see that political principle, political "honesty," the "patriotism" of politicians, are all "bosh"—all lies; or if anything of the kind ever existed in the "stock," it has been "*root-grafted*" for the peddler's market. And there is no way of treating either the peddlers of *trees*, or the peddlers in our *votes*, but to enter the market with them, side by side, and let genuine TRUTH and real HONESTY live down and *talk* down both of them.

"TRUTH is mighty and will prevail," but it can't go alone. Like the gardener, it stays about home—while a *lie* and a *tree peddler* have rapid feet and gather force as they go. But the great Father of Nature and All Good has ordained that every good thing shall have its chance for life, with that which appears to us all evil. Every State has its opportunity for revolution and regeneration. Our opportunity is *now!* And yet WE, as Producers—as "four-fifths of the population"—have nearly let our best State chance slip by in the hands of our foxy politicians. Our Constitutional Convention should have been, and may, even yet, be our great State opportunity. We should have elected three-fourths of the members of that convention. Have we elected one-fourth? Have we even ten members from the ranks of agriculture? If we have

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half that number, I will wager my life that *five of them are more of politicians than either* FARMERS or MECHANICS! And without having seen a single announcement outside of Cook county, I will venture another more positive assertion: three-fourths of them *are* lawyers!

Still, even lawyers may be made to see something beyond "precedent." Many of them have *heads*—nearly as long as their tongues. I know a few such; and to these we must look for *justice*—not law—for law and justice are not always the same.

As to the rural element in the State Convention, I know nothing, and hope nothing from it—one hybrid case excepted—and a "hard case" at that! One of those physiological "exceptions," said to prove all general rules—especially one of *our* professional rules, viz: that a "high head" is not a safe head, and that a powerful and efficient brain is rarely found with its base six feet above the sole of the human foot. And yet I have more faith in this one "tall" politician, and sometime "farmer," than all the agricultural element besides, as likely to aid our views in the Constitutional Convention.

Now, what shall we demand? We must ask, and *not be denied*, a full and explicit recognition of AGRICULTURE in all its related interests. The State Agricultural Society has done wonders, but *its* mission is not ended. We need, and we *must have*, and our children *will* have—at least three schools of *practical* education, (including modern languages,) in the three great natural divisions of the State, and all *supported by the State*. I don't mean "manual labor schools," or "model farms," or even model manufactories—all of which are, to my mind, unmitigated humbugs, or insane illusions.

The Normal University is a good beginning for the Central school. Beautiful "Egypt," glorious and patriotic Egypt, has spots enough for another; and the pupil of Francis Wayland, and his geological aid here in Chicago, have taken the initiatory step for the third. Let us have them secured to us in the organic law of the State.

We have neglected to send our own men to this convention, and yet it is just as easy for us to secure all this as to turn our hand. Have YOU forgotten the late lesson you taught the bank politicians? If you have, *they* have not. Demand this and you will get it, if you previously determine, and let your determination be known, to *veto* the work of this "Constitutional Convention," if our rights are not recognized. We have the politicians at disadvantage here, and believe me, we shall have the "third estate"—the PRESS—with us, in this battle. Let it come. Sooner or later, we shall prevail, and LABOR receive its just dues from the State.

But there is another question, which, like slavery in the Union, is at the bottom of all our troubles, and which we *must curb*, and may be compelled to uproot, ere we can enjoy peace, or anything

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like freedom, or the right of self-government, through our boasted rights of election. The *caucus* and *convention* system, which virtually deprives nine-tenths of the voters of all the rights of the ballot—and every expression of the will of the "majority"—save only a choice between two men, or two measures, forced upon us by trickery! Let the new constitution abolish this most damnable of all political evils—or let us *veto* it—as we did the last wild-cat bank law! For ourselves, as Horticulturists, as a Society, let us ask "Egypt," our next rendezvous, to join us in demanding the pittance we may need from our State legislature, and we shall get it. The times are too "scary," and we have too many sons in that great armed Convention, along our rebel borders (who may yet imitate our Puritan forefathers, and make THE ARMY "the State") for *politicians to deny*, seriously, what we *demand* earnestly.

In the meantime, let our peaceful pursuits go on. The beautiful which we create, will be "a joy forever"—whether we live long to enjoy it, or soon leave the growing legacy to our children, and generations to follow them. Our natural mission is one of unmixed beneficence. By the help of the law of Nature, and the rules of rural taste, we are painting living landscapes, and dotting the bald prairies with perennial verdure—strewing, here and there, as we go, such timely supplies of the cooling and luscious products of modern pomology, as the earlier worshippers of the fruity goddess never dreamed of out of Eden! And soon—very soon—we may hope to present the thin-blooded invalid and slow-pulsed patriarch with such a "cup" as might have raised Bacchus above Jupiter, and will do more for temperance and jollity than all the sermons on the sin of drunkenness, and all the impossible provisions of human law ever uttered or enacted this side of time.

And now, let's all to the practical work before us. My last "inaugural" and anticipated "valedictory" are ended together.

THE SAP-SUCKER.

By P. R. Hoy, of Racine, Wisconsin.

There is a singular want of agreement, in the written statements found in the various agricultural journals, respecting the Sap-Sucker. One writer asserts that the Sap-Suckers molest trees only that are infested by worms; that the worms are what they are after, and nothing more. Another, as stoutly contends, that they are not in quest of worms, but the *vital juice* of the tree—the sap—to the great damage of the orchard. These various statements show a want of close, careful, discriminating observation—something by which we can determine the precise species of bird, to which they refer under the name of Sap-Sucker. This is the more neces-

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sary, since all of our spotted *Woodpeckers*, and even the *Nuthatchers*, are, by many, indiscriminately called Sap-Suckers.

A term, so indefinitely applied, should either be discarded, or restricted to one species—the one I hold in my hand—which not only sucks the sap, but eats the inner bark of various fruit, ornamental, and forest trees.

This species is the *Yellow-bellied Woodpecker*, (the *Picus varius* of naturalists) and may be known by the bright red spot on the head; and in the male also on the throat, the female having the red on the head, but lacking that on the throat. Length, eight and a half inches; expanse of wings, fifteen inches. A black spot in centre of breast; belly, light yellow; tail, black, the two central feathers white on their inner vanes, and spotted with black; bill dusky horn color. The tongue of this species is quite unlike that of any other of our woodpeckers. The tip, or horny portion, being rounded at the point, and highly developed, while the length of the tongue renders it incapable of being protruded much beyond the point of the beak—in vastly the majority of cases not more than half an inch.

On the contrary, in the Downy, Hairy, and all other worm-eating Woodpeckers, the tongue can be protruded from two to two and a half inches beyond the beak, and is provided with a narrow, sharp, horny point, plentifully supplied with recurve barbs, a most perfect instrument for abstracting worms from their burrows. The outlines, on the opposite page, will represent the difference more perfectly.

Fig. 1 represents the head of a worm-eating Woodpecker; figure 2, the head of the *Picus varius*, the true bark-eater and Sap-Sucker.

Prof. Baird, of the Smithsonian Institution, has constructed the new genus Sphyrapicus, of which this species is made the type; a wise disposition, undoubtedly, for in anatomy, habits and voice, it is widely distinct from the so-called Spotted Woodpeckers.

The *Picus varius* arrives at Racine generally within a few days of the 15th of April, usually after a rather warm night, for Woodpeckers, like most land birds, migrate only during the night. Then is prime "boy time;" armed with bows and arrows, stones, clubs, cross-guns, and the like, they wage a vigorous war on the Sap-Suckers, while they, in turn as engergetically attack the Mable, Mountain Ash, Pine, Spruce, Pear, Apple, Plum, Cherry, Peach, and Silver Poplar. But if they damaged no more valuable trees than this Silver Poplar, I should not appear here in judgment against them. About the 1st of June they retire to the seclusion of the forest to nest, feeding at the time mostly on the Iron-wood, Wild Cherry and Bass-wood, but continuing daily to visit neighboring orchards, to feast on the more palatable cultivated trees. In September they reappear, with a large reinforcement, consisting of the young, which at this time lack the large red spots, and continue their depredations until the last of October, when they take

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their departure South. It is during the autumnal visit that they do the greatest damage; for in spring, when the vital forces of vegetation are unusually active, the tree recovers more certainly from the wounds inflicted, while in the fall, vegetable life being less active, the septa between the punctures are more likely to dry, leaving the tree dead, or crippled for life. The Sap-Suckers attack the most thrifty trees, but after they have suffered a siege from these Sap-Suckers, they are thrifty no more. If not killed, they are so stunted that they fall an easy prey to the bark lice, which are sure to come in for a part of the spoils; for when an orchard tree is enfeebled from any cause, bark lice are sure to finish the work.

Health and *vigor* are capital preventives for the Coccus. The wounds made by the Sap-Sucking (better say bark-eating) Woodpecker are carried down to the wood, and a portion of the inside bark, (*Liber*,) and the gelatinous substance between the bark and wood (*Cambium*,) are eaten out. These openings are from one-eighth of an inch to one inch in diameter, and are generally made in regular lines, running around the tree, girdling the trunk and larger branches with one of more rows of holes; sometimes the line of punctures extends longitudinally, as in the specimen of Mountain Ash exhibited. The punctures are generally placed so near to each other, that the divisions have not sufficient thickness to carry on the circulation. They are a silent bird, seldom uttering a note while feeding; an occasional *Kewee*, *Kewee*, when about to wing, uttered in a minor key, is their only voice. I have shot and dissected many at all seasons, and, in vastly the greater number of cases, I have found nothing in their stomachs, but bits of bark—not a trace of an insect. Occasionally, I have found a few small Coleoptera, but never the larva, of those little pests, the borer, and for a very good reason—the bird has not the tools for extracting them.

These facts I communicated to Prof. Leida, of Philadelphia, who advised me to send him the specimens in alcohol. Accordingly I sent him a bird, shot while it was engaged in breakfasting on a Silver Poplar. I also chipped off that portion of the bark on which it was operating at the time. In reply, Prof. Leida states that his dissections confirmed my statements in every particular. The damage done by these birds to orchards and ornamental grounds is considerable—second only to that of the bark louse. There is not a garden or orchard of any size in the vacinity of Racine that has not lost trees killed by the Sap-Sucker. The best remedy—small shot and a sharp lookout.

There are two birds—and two only—that I would rejoice to see exterminated: this Woodpecker, and the Cedar Bird. I have de-

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Sap-Sucker. Length, nine inches; expanse of wings, fifteen inches; crown black, breast and beneath white; wings, black, spotted, and tipped with white; outer tail feathers white. Male, with a small, interrupted, red occipital band, which in the female is black. This species is not migratory, but remains the entire year with us. Cheerful and industrious, he is always on the lookout for those worms that burrow in the substance of the wood, or under the bark of trees—the larvae of the Capricorn Beetles, the Bupestridae, etc. He is an expert at auscultation and percussion, and he is not indebted to Lænnec for the art either. As he explores suspicious localities with gentle taps, he quickly detects the evidence of unsoundness, and is not slow to learn the cause. *Worms* are his hobby; soon he chips an opening, and with his long, slender tongue, armed with a barbed lance point, a capital tool, he soon extracts the cause of the evil. While engaged "worming," he continues to utter his cheerful *Plick, Plick*, in a major key, as if conscious that he is engaged in a good cause, and not ashamed to own it. You can always tell where he is. A few ears of corn is about all the pay he takes for his valuable work. Protect him; he is our friend. May that gun ever hang fire that is directed against the Hairy Woodpecker.

The Downy Woodpecker (*Picus pubescens*) is the smallest of American woodpeckers, being not over six and three-fourths inches in length, and twelve inches in expanse of wings. In color, markings and voice, it is almost precisely like the Hairy Woodpecker, differing only in size—a mere pocket edition.

This species has had grave charges made against it, and by grave men, too. Yet I must believe these charges unfounded—that he has unjustly been made accountable for the depredations of the true Sap-Sucker (*Picus varius*). That they do in early spring stick their bills into the maple, and a few other trees, for the purpose of slaking their thirst on the sap, I have had occular demonstration. These wounds are mere punctures, and not a gouging out of the bark, doing little or no damage to the tree. I have shot them under suspicious circumstances, but on dissection, have found not a particle of vegetable matter in their stomachs; on the contrary, there was abundant evidence that they had been engaged in a good work, as indicated by the abundance of worms found. These industrious little birds do valuable service in destroying the pupæ of the different species of Silk Moths. I exhibit specimens of the Cocoons of the *Atacus polyphemus*, disemboweled by the Downy Woodpecker. In winter, when the trees are stripped of leaves, these Cocoons are readily found and destroyed—a work, so far as I have observed, monopolized by the Downy Woodpecker alone. They also search out and destroy the borers that infest the currant bushes. Another of our friends—give him a welcome.

The White-breasted Nuthatch (*Litta Caroliensis.*) Another bird not belonging to the Woodpecker family, which is erroneously called Sap-Sucker. A small, lead-colored bird, with black head

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and neck above, white beneath. It may readily be known from his habit of running around the trunks of trees, with his head down, uttering the simple note, "Pah, Pah." They feed mostly on the seeds of trees, such as Ironwood, Elm, Maple and Beach-nut; they are especially fond of pumpkin seeds. Boys take the advantage of this to capture them by means of a "figure four" trap baited with these seeds.

It is interesting to watch the movements of the Nuthatch, as he runs down to the root of a tree in quest of food. Should he find a seed or nut, he runs back up the tree, until he finds a suitable crevice in which to fix it, while he places himself above it, and with head down, he picks it to pieces. They also eat many small insects that they find running over the trunks of trees. Let them live.

In answer to questions, the Doctor made the following replies: The Bee bird will eat bees, and working bees even, when he cannot get drones, but does little damage. The Red-headed Woodpecker does no damage in the sap-sucking fashion. The very large Woodpecker keeps the borers in pine, etc., in check. The lecturer exhibited specimens of the work of a large species of Curculio found on the branches of young trees. The Curculio works in the spring and destroys the shoots. The leaf-rolls found on trees contain eggs, which hatch out millers—are not injurious. The Lace Wing clears off plant lice. The Lady Bug is a very useful beetle.

Small shot is the best remedy for Sap-Suckers. It should be small so as not to injure the trees.

Mr. Douglas said that whitewash with soot mixed in and rubbed over the smooth bark, would stop their work. Another member recommended whale oil soap.

PLUMS.

Grafting.—Dr. Hoy explained his method of grafting on the wild stock, by cleft grafting in the side of the root.

He recommended the following varieties for the vicinity of Racine:

1. *Smith's Orleans* is the finest: brought seven dollars per

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Phœnix said, that at Havana, on the Illinois river, he had seen plums bearing very full on barren sand.

Dr. Hoy said he preferred excess of sand to excess of clay. Scrapings from the street were the best manure for his locality. Some had put in too much lime, and permanently injured their soil. A Welsh gentleman of his acquaintance had put on an abundance of lime, where two or three per cent. existed already, and his third crop was still injured thereby.

In answer to Mr. Kidder, who stated that the Chicago muck was a poison, the Doctor suggested the addition of lime to neutralize the acid.

THE CURCULIO.

Dr. Kennicott said that the family was a numerous one. Wheat, the Pea, the Hazlenut, had each their kind.

The remedy for Curculio in plums is to pick up all the plums, leaving the ground clean and packed tight with clay. If all the plums are killed one year, you will have a good crop the next. The planting of trees in much frequented places may be of benefit. The fruit may be crushed and the ground trodden hard, so as to leave no burrowing place.

ON WINTER PROTECTION TO GRAPE VINES.

REPORT OF COMMITTEE:

Mr. President and Gentlemen:

Your Committee, to whom was referred the subject of winter protection of Grape Vines, having had the matter under consideration, would respectfully report that it is our opinion that all vines growing in the open air, however hardy they may be, will bear fruit of better quality, in greater quantity, and with less liability to failure, by protecting them in winter, by laying them upon the ground in such a manner that water will not settle and freeze about them, and covering with earth or coarse straw litter; and that this may be done conveniently, we recommend that they be fall pruned, and cultivated with reference to giving them such protection; and that the vines may be conveniently laid down closely to the ground without danger of breaking or splitting them, we suggest that they be pressed over, when young, in such manner that they will rise from the ground in an oblique or curvilinear instead of a perpendicular direction.

C. N. ANDREWS.
M. L. DUNLAP.

BLACKBERRY CULTURE.

By James Ozanne, jr.

In the autumn of 1854, I procured of W. Lawton, New Rochelle, one dozen New Rochelle blackberry plants, and set them out on a prairie soil in the latter part of October. The following summer they made a good growth. The winter of 1855–6 killed them almost entirely, so that with difficulty I found a few small roots that with care made a feeble growth in the summer of 1856. The winter of 1856–7, I partially protected them, and in the summer of 1857, I had a fine growth and a large increase of plants, which bore a few large berries in the following year, 1858. I did not

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keep back suckers, so that in the years 1859 and 1860, I had a perfect thicket from my original setting-out, which bore a few berries without protection, generally small, with an occasional good sized one. In the fall of 1859, I laid down a few canes, covered with earth. These, notwithstanding the drought of 1860, bore heavily. I also set out a small plantation that spring, kept back all suckers, protected them last winter with straw, and in some instances a little earth, just enough to keep the straw from blowing off by the wind, and this year every cane was loaded to its utmost capacity with the largest kind of berries; so much so that some of the laterals broke down under the weight of the fruit. I might state that the plants were set in rows six feet apart, and four in the rows, pruned in the summer of 1860, to about five feet in hight, and laterals cut back this spring at least one-half; and what I consider of great importance, all suckers kept down, by cutting them off as soon as they appeared. The quantity of fruit was estimated by several who saw them to average four quarts to the bush. I did not estimate it at over three quarts, which I know to be the fact. If picked when *ripe*, the fruit is of good quality.

The Egyptian Blackberry.—Two years ago last spring I procured a half dozen plants of this variety, which have borne a few berries this year, about one-half the size of the New Rochelle, and about one-quarter the quantity of fruit on same size canes of New Rochelle; of good flavor. I might add, with protection.

Dorchester.—Bears well with me; requires protection, and is a sweeter berry. The quantity of fruit, about half that of the New Rochelle on same size canes.

Newman's Thornless.—Has borne good crops of good sized berries, of tolerably good flavor. Has the advantage that it can be laid down as easily as the raspberry, which is not the case with the New Rochelle, as those who have tried it can testify. Requires protection.

TREATMENT OF PLANTS IN A FROZEN STATE.

Dr. Kennicott said he had had a great many trees frozen and had lost but one lot. When well packed and properly thawed he had not lost a tree. He generally left his business, took his trees home, selected a piece of fine soft ground, stripped the bundles as well as he could, laid them in a trough, and took them out in the spring all right. Another lot he put down cellar, where the temperature was about 40 deg., and let them thaw out gradually. He was of the opinion that in the case of hardy plants, when properly packed, one gradual thawing did not hurt them in the least. In covering in the ground, great care should be taken to have the earth come in close contact with the root, to exclude the air. In regard to packing, he thought that puddling in clay was the best and most satisfactory manner with which he was acquainted. The clay becomes solid and does not ferment.

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ILLINOIS STATE HORTICULTURAL SOCIETY.

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12th " Geo. Barry.....Alton, Ill.
13th " T. J. Evans.....South Pass, Ill.

CORRESPONDING SECRETARY.

W. C. Flagg.....Moro, Ill.

RECORDING SECRETARIES.

W. G. Ferguson.....Rockford, Ill.
K. H. Fell.....Bloomington, Ill.

TREASURER.

Samuel Edwards.....LaMoille, Ill.

EXECUTIVE COMMITTEE.

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COMMITTEES APPOINTED AT THE MEETING OF 1862.

On Communications—G. W. Minier, Smiley Shepherd, Jno. P. Reynolds.

On Name of White Willow—Dr. Jno. A. Warder, Arthur Bryant, sr., C. R. Overman.

On Fruits—Dr. Jno. A. Warder, Arthur Bryant, sr., A. R. Whitney.

On List of Wine Grapes—Dr. J. A. Warder, N. J. Colman, Dr. C. N. Andrews, Smiley Shepherd, Dr. N. Schroeder.

On Early Richmond Cherry—Dr. J. A. Warder, C. R. Overman, F. K. Phœnix.

On Lists of Peaches from different sections of the State—C. D. Bragdon, W. C. Flagg, N. J. Colman.

On a List of Hardy Peaches—Smiley Shepherd, Arthur Bryant, sr., L. Shearman.

On Resolutions—E. Baldwin, N. J. Colman, H. N. Bliss.

On Lists of Pears for all sections of the State—James Spencer, Bloomington; Arthur Bryant, sr., Princeton; C. R. Overman, Bloomington.

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ANNUAL MEETING, 1862.

The Society met in Phœnix Hall, in the city of Bloomington, December 2nd, 1862, pursuant to the call of the President. President, O. B. GALUSHA, of Lisbon, in the Chair.

The Committee on Programme of Business made a report, which was adopted as the order of business.

The President then addressed the Society as follows:

PRESIDENT'S ADDRESS.

Gentlemen, Members of the Illinois State Horticultural Society:

The season has again arrived when we are accustomed to meet for the discussion of those topics which we deem of importance in promoting the prosperity of the Society, and in carrying out the objects for which it was instituted. Each recurrence of our annual gathering forms one of the bright pages in our individual histories—one of the oases in life's journey which gladdens all our hearts, since all are here re-united in the common bond of brotherhood, which is wont to link those whose tastes harmonize, and who are laboring to promote one common end—to achieve one grand result.

More especially is this true when the *end* to be gained will prove a permanent blessing to mankind, and where the *means to* the end include the cultivation of the tastes, and the refinement of both the mind and the heart. It is with mingled pride and pleasure that I would refer you to our history as a Society—to the good results in the various departments—to the perfect harmony of feeling which has prevailed in all our discussions—the deference which each has paid to another's opinions, how much soever they may have differed from his own—in short, the good will with which each has been greeted, and the uniform good fellowship which has characterized all our intercourse, whether public or private. Where is the Society of equal numbers that can boast six years of similar history?

These pleasant memories should induce in us a constant watchfulness lest this most excellent harmony be broken. Let it never be said of us that "at *such* a period of our history dissensions arose which disturbed the harmony hitherto prevailing, retarded the progress of the Society, and diminished its influence for good."

Let us, rather, in conducting these discussions, and deciding all questions which may come before us, forget all personal interests, keeping in view and seeking only "the greatest good to the greatest number."

In recalling our past history, we see much to stimulate and encourage us for the future. From a little handful of zealous men, who, six years ago, met in a small room in the neighboring city of Decatur, where this Society had its birth, its numbers have constantly increased, until they are now counted by hundreds. Our influence is being felt for good in almost every township in the State. Young groves are springing up which are destined to add beauty to the landscape and value to the farm. Here and there we see homes which are being made attractive by embellishments in their surroundings—improvements are being made in the varieties of fruit, and the modes of cultivating them—our records are eagerly sought by many intelligent persons who are about to plant orchards, groves, hedges or gardens, that they may learn *what* to plant, *how* to plant, and *how to cultivate*.

It is much thus to have gained the confidence of this class of our fellow-citizens, and to have imparted to them so large an amount of useful information. Yet we find a more widely extending influence than this, affecting, though as yet in a slight degree, a much larger portion of the cultivators of the soil, who are themselves almost entirely ignorant of its origin. Our discussions, essays and addresses have awakened a more general interest in *tree planting* for timber, and for protection, as well as for fruit and decoration, the result of which is the planting of *five trees now* for every *one* that was planted *six* years ago.

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Even upon those subjects on which *positive* instruction could not be given, a spirit of inquiry has been excited which will not readily subside, but which will almost certainly lead to the acquisition of the knowledge sought.

During the past season we have made a public exhibition of the products of our taste and skill, doubtless surpassing, as a whole, any similar exhibition ever held in the great West; at which were gathered together rare trees and plants, beautiful flowers, luscious fruits, and the rich productions of the kitchen garden, in almost countless variety, the whole arranged for the most pleasing effect, delighting all beholders, and convincing all that the great Prairie State is not behind any of her sisters in the variety or richness of her horticultural products. May we not hope that this exhibition has given a fresh impetus to our cause, which will lead to still greater results?

While it gives us all sincere pleasure thus to look over the past, and dwell upon the good which has already resulted from our labors, yet we cannot lose sight of the fact that we have but just entered our sphere of usefulness. So much yet remains to be done, that the progress already made seems but a single step of a journey, in which many thousands are to be taken, each succeeding one of which promises its own reward, disclosing new beauties as it leads us on, and directs to a *nearer approach* to perfection just beyond.

Many serious obstacles also lie before us. An almost innumerable multitude of the insect tribes seem to bid defiance to our skill, threatening to destroy even the most desirable in fruit and flower. *These enemies must be met and vanquished.* Doubtless there are poisons within our reach for the easy destruction of every species which annoy us. It is our work to discover and apply these remedies.

Within the last seven years, we have all had experiences which were entirely new to us. The spring months of 1856 revealed to us the terrible truth that, during the preceding winter, a wide-spread destruction had spread over the State, carrying sudden death to one-fourth of all of our fruit-bearing trees, and poisoning the remainder in such a manner that one after another, in all our orchards, have since fallen victims to its blighting influence, until it is to be feared that few will ever entirely recover. This experience has not been lost upon us, but is even now beginning to exhibit the benefits which have resulted, and will continue to accrue from it. It has led us to seek for a more thorough knowledge of the laws of vegetable anatomy and physiology, and to devise the means necessary to maintain those laws. This field of our usefulness is but just entered. Who can estimate the importance of the results to which it may lead!

While I would not presume to dictate to you the processes of experiment and investigation in this field, yet you will pardon me if I refer to one or two of the laws which must underlie the whole process, which, if entirely lost sight of, our labors will be unsatisfactory. I allude especially to the *fixed law* of the hereditary transmission of diseases and so-called "constitutional biases."

While the strict observance of this law is regarded as of the utmost importance in the rearing of animals, yet it is either repudiated, or almost entirely disregarded, by a large proportion of the propagators of trees and plants. Yet this law is universal in its application, and inflexible in its nature, in the vegetable as well as in the animal kingdom.

It is *well* to know how to treat trees of feeble or diseased constitution, yet *it is far better to learn the art of propagating such as shall inherit no taint or "predisposition" to disease.* Combatting us in our experiments in this direction, we meet a *common*, though not like the former, a universal law of a *tendency* to a loss of constitutional vigor, or a deterioration of the "powers of endurance" and reproduction in the tree, or plant. This tendency commonly exhibits itself in the want of vitality in the seeds, (or, in many instances, in the entire absence of seeds,) and often seems to be in direct ratio to the improvements made in the quality of the fruit, or the beauty of the flower. Hence the importance of guarding against propagating from either seeds, buds, or cuttings from feeble, tender or diseased trees, shrubs or plants.

In conducting a series of experiments to produce these and other desired ends in horticulture, we see the urgent demand for an experimental garden, under the control of this Society. In such a garden, under the superintendence of a persevering, scientific man, who would aim to bring the principles of science to bear upon the production of improvements which might be made *available* even by the unlearned and unskillful, results might be accomplished in *five* years which it would take a *score* of years to arrive at *without* such facilities. Our Society is not yet strong enough to establish such a garden without the assistance of the government, or the co-operation of some kindred society or association. Yet I hope the day is near when we may secure such legislative aid as we need; or unite with one of our agricultural colleges in the establishment of a horticultural department which shall be subject to our control. At present these experiments must, of course, be the work of personal skill and enterprise. In our associated capacity, we can recommend plans and systems of experimenting, and yet it is for each one of us to carry those plans into our individual practice.

As a society, we have a great work to do in reclaiming these vast prairies from the state of comparative nudity in which we yet see them. *Trees—trees* are to be the great remedial agents. It is for us to direct in respect to the varieties best suited to the various ends desired, and how those varieties are to be arranged so as to combine at the same time the most pleasing effect to the landscape, and yield the largest profit to the owner. Our first

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and *chief* efforts in this direction must be to instruct the masses of the people through every available channel of communication, in regard to the benefits which will accrue to themselves and their children, by engaging at once in this great work. They must be induced to plant orchards, by showing them not only the pecuniary profits of fruit raising, but the healthful influence upon the human body, of the free use of ripe fruit. For it is the testimony of the most scientific physicians, that not more than one-fourth the amount of fruit is used by the American people which should be used to promote their highest health. They must be persuaded to plant groves and belts of trees, by showing them the great value of these in sheltering their animals and preserving their crops from the destructive effects of our violent winds and tempests.

True, we have already said and written much upon this subject—*so* much that we almost tire of repeating the facts and figures by which it is so easily domonstrated. Yet we who realize the importance of our work, and know the *certainty* with which such protection may be rendered, should not relax our efforts to convince others also, until the desired end is gained—until these terrible storms which so often sweep over our prairies, destroying such vast amounts of property, and sometimes even life itself, shall either "be numbered among the things that were," or, at least, their *force* be so far broken that they will be *comparatively* gentle and harmless. This we know to be no fanciful result, but one which is entirely in accordance with nature's laws. I have thus called your attention to a few of the items of our future labors. I might add suggestions upon many other important points which demand the attention of this Society.

The principal obstacle to our progress exists in our inability to publish our transactions and papers in such numbers that they may be mane available by the whole people. Did our legislators prize the work in which we are engaged, as its real merits warrant, they would aid us in carrying it out. Let us not cease to pray to them, at each of their sessions, for this needed aid—using the arguments and facts to which I have already alluded, to convince them of its importance; showing them also, as it may be shown, that for every dollar judiciously expended in publishing reliable information upon these subjects, *many* more would ultimately return to the treasury, while at the same time, *far less than now would be drawn therefrom* for the support of pauperism and the punishment of crime; for we are well assured that wherever a love of horticultural pursuits, and an admiration for the *beautiful* in horticulture, is instilled into the minds of the young, it exerts a refining influence upon their tastes and their hearts, which will incline them to seek for higher pleasures than those found in the haunts of dissipation and sin.

The publication of our minutes has, thus far, been mainly accomplished by the voluntary contributions and personal sacrifices of our members. True, we have been allowed space for a condensed report in the volume of the Transactions of the Agricultural Society, yet how few, comparatively, gain access to these volumes.

Could we procure sufficient aid to enable us to publish annually a hundred thousand small pamphlets, containing the most reliable information upon horticultural subjects, and distribute these into every school district in the State, a far greater work would be accomplished than any number of voluminous reports like those now published could effect, as they would be more generally read. And when we can get the people to read upon these subjects, our work would be easy and our progress certain.

My friends, I congratulate you upon the prospect of a successful and profitable meeting. While we all realize that at the present moment our country demands our best efforts to save it from the ruthless hands of those who have risen up and vowed its destruction; while our brothers and our sons in the field have our warmest sympathies; while our fervent prayers cease not to ascend that the God of nations may forgive our personal and national sins, and save to us and our children, our native land, we still deem it our duty to persevere in those enterprises which are so much needed to promote our highest ultimate prosperity. That while we look forward to a permanent peace, founded upon the principles of equal justice to all men, we may also contemplate the happy results of our efforts in our own vast Prairie State, adorned with beautiful groves—with orchards laden with the most delicious fruit—rural homes surrounded with those embellishments which indicate refinement and skill—the whole combining to fulfill its manifest destiny as the great central Garden of the Union.

VAN MONS' THEORY—EXPERIMENTS IN ILLINOIS.

By Dr. J. A. Warder.

The following facts have been elicited from correspondence with H. P. Brayshaw, of Du Quoin, Illinois. The experiments were instituted by his father many years ago, to test the truth of the so-

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called Van Mons' theory of the improvement of fruits by using only the first seeds.

Mr. Brayshaw quotes from memory chiefly, having kept no record. Thirty-five years ago, in 1827, his father procured twenty-five seedling trees from a nursery, which may be supposed to have been an average lot, grown from promiscuous seed. These were planted, and when they came into bearing, six of them furnished fruit that might be called "*good*," and of these "four were considered *fine*." One of the six is still in cultivation, and known as the *Illinois Greening*. Of the remainder of the trees, some of the fruits were fair, and the rest were worthless, and have disappeared.

Second Generation.—The first fruits of these trees were selected, and the seeds were sown. Of the resulting crop, some furnished fruit that was "good," but they do not appear to have merited much attention.

Third Generation.—From first seeds of the above, one hundred trees were produced, some of which were good fruit, and some "even fine," while some were very poor, "four or five only merited attention." So that we see a retrogression from the random seedlings, furnishing twenty-five per cent. of good fruit, to four or five per cent. in the third generation, that were worthy of note.

Fourth Generation.—A crop of first seed was again sown, producing a fourth generation; of these many were "good culinary fruits," none, or "very few being of the poorest class of seedlings," none of them, however, were fine enough "for the dessert."

Fifth Generation.—This crop of seedlings was destroyed by the cut-worms, so that only one tree now remains, but has not yet fruited. But Mr. Brayshaw appears to feel hopeful of the results, and promises to continue the experiment.

2nd. Crops have also been sown from some of these trees, but a smaller proportion of the seedlings thus produced were good fruits, than when the first seeds were used—this Mr. Brayshaw considers confirmatory evidence of the theory, though he appears to feel confidence in the varieties already in use, most of which had almost an accidental origin.

He thinks the result would have been more successful had the blossoms been protected from impregnation by other trees, and recommends that those to be experimented with should be planted at a distance from orchards, so as to avoid this cross-breeding, and to allow of what is called breeding in and in. If this were done, he feels confident that "the seedlings would more nearly resemble the parent, and to a certain extent would manifest the tendency to improvement, and that from the earliest ripened fruits, some earlier varieties would be produced; from those latest ripening, later varieties; from those that were inferior and insipid, poor sorts would spring, and that from the very best and most perfect fruits we might expect, one in one thousand, or one-tenth of one per cent., to be better than the parent. This diminishes the chance for im-

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provement to a beautifully fine point upon which to hang our hopes of the result of many generations of seedlings occupying more than a lifetime of experiments.

Mr. Brayshaw, citing some of the generally adopted axioms of breeders of animals, assumes that *crosses* as of distinct races, will not be so likely to produce good results, as a system of breeding in and in, persistently carried out. This plan he recommends, and alludes to the quince and mulberry as suitable species to operate upon, because in them there are finer varieties, and therefore less liability to cross-breeding, and a better opportunity for breeding in and in. He also reminds us of the happy results which follow the careful selection of the best specimens in garden flowers and vegetables, combined with the rejection of all inferior plants, when we desire to improve the character of our garden products, and he adopts the views of certain physiologists, which, however, are questioned by other authorities, to the effect that violent or decided crosses are always followed by depreciation and deterioration of the offspring.

The whole communication referring to these experiments, which are almost the only ones, so far as I know, which have been conducted in this country to any extent, to verify or controvert the Van Mons' theory, is very interesting, but it is easy to perceive that the writer, though apparently very fair, and entirely honest, has been fully imbued with the truth and correctness of the proposition of Van Mons, that the first ripened seed of a natural plant was more likely to produce an improved variety, and that this tendency to improvement would ever increase and be most prominent in the first ripened seeds of successive generations grown from it.

The theory of Van Mons I shall not attempt in this place to controvert, but will simply say that nothing which has yet come under my observation has had a tendency to make me a convert to the avowed views of that great Belgian Pomologist, while, on the contrary, the rumors of his opponents, that he was really attempting to produce crosses from some of the best fruits, as our gardeners have most successfully done in numerous instances, in the beautiful flowers and delicious vegetables of modern horticulture, have always impressed me with a color of probability, and if he were not actually and intentionally impregnating the blossoms with pollen of the better varieties, natural causes, such as the moving currents of air, and the ever active insects, whose special function in many instances, appears to be the conveyance of pollen, would necessarily cause an admixture, which, in a promiscuous collection, like the "school of Van Mons," would at least have an equal chance of producing an improvement in some of the resulting seeds.

The whole subject of variation in species, the existence of varieties, and also of *sports*, which may perhaps be considered as still more temporary variations from the originals, than those which come through the seeds, is one of deep interest, well worthy of

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our study, but concerning which we must confess ourselves as yet quite ignorant, and our best botanists do not agree even as to the *specific* distinctions that have been set up as characters of some of our familiar plants; the most eminent authors differing with regard to the species of some of our most familiar genera of trees and plants.

ORCHARD CULTURE.

By Dr. Jno. A. Warder.

After the trees have been well planted, in their new home in the open field, the next topic that demands our attention is the culture that will be most appropriate for them. The practice of some is, that of no culture, which, with the usual neglect that accompanies such treatment, is certain to end in disappointment from the loss of the trees; for no matter how good may have been the selection in the nursery, nor how thorough the preparation of the soil, nor how careful the planting, the young orchard will never develop its highest degree of perfection, if left at this stage of its progress to take care of itself. If neglected now, it will go back and prove a failure, as any one may have seen who has observed the thousands that are thus annually immolated in various parts of the country.

It being conceded that thorough culture is necessary for the proper development of the young trees, it may be next asked whether any other crop should be planted in the orchard. Most writers advise the planting of a hoed crop, and prohibit altogether the sowing of grains or grass among the trees.

The answer to this question will depend upon the condition of the soil as to fertility. If poor, it will not do to rob the trees, which are the main crop; but it is seldom the case that such poor land is selected for an orchard. Generally our soils are sufficiently fertile to admit of cropping, at least partially, between the trees, without injuring them.

This is not without reason; for the long period between seed-time until harvest, and the grain and the trees make their growth simultaneously, that the soil about the roots has to lie without the disturbance of the cultivator, for the admission of air and moisture, causes it to become compact and dry, and the trees must suffer. The partial culture with the spade immediately around the trees, which has been proposed as a remedy, is very seldom thoroughly done, nor to a sufficient extent, and is generally neglected entirely, so that the poor trees are not only robbed by the surrounding grain crop, but worse than this, they are imprisoned in the hard soil, which is left after harvest in a condition unsuitable for plowing, and the droughts of summer continue to injure the trees. Such crops as require or admit of the occasional use of the plow and cultivator among them, enable the farmer to keep the soil loose and

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mellow among his trees. This is the reason they should be selected for planting in a young orchard. These are called hoed crops. Some prefer such as are of low growth, others think that Indian corn is the very best crop, and suggest that the shade cast by it upon the ground about the trees more than compensates for the injury caused by the roots absorbing the moisture from below.

Whether we plant any other crop or not, let it be distinctly understood and constantly borne in mind that the young trees must be cultivated. The ground must be constantly stirred and kept clean, until the orchard has fairly got under way with a thrifty growth. This best effected by continuing the culture for some years, and as men are often unwilling to work without an immediate return for their labor, the naked fallow among the trees will too often be neglected; but the partial crop between them is an incentive to giving the orchard just such attention in the way of cultivation as it requires.

The length of time that this culture should be continued will depend upon the condition of the trees, and the character of the soil and surface. The orchard should have assumed the most thrifty growth before the cultivation is suspended, whether this have required three years of culture, or six; but on hilly lands, with a soil disposed to wash into gullies, we cannot continue the cultivation with impunity, but must use such an alternation of crops as will obviate the necessity for constant open culture. This may be arranged by an alternation of clover with corn or potatoes, which is a most valuable rotation, since this legume is in itself almost a cultivator of the soil, rendering it loose and mellow, while at the same time the surface is clothed, and the soil is bound together by its roots. The clover may be sown at the last plowing of the corn, with or without rye, which is only used for the sake of clothing the surface, and preventing the washing of the soil during the winter, and should be pastured by hogs the following season, by no means to be harvested. After one year the clover should be plowed in, and the cultivation of the young orchard should be continued until the trees be well established, when the land may again be laid down to clover and allowed to continue in this crop for an indefinite period, or until plowing appears to be again needed.

The above remarks as to the treatment of the young orchard apply to soils of average fertility. There are portions of the country where the growth of orchards is too rampant to permit an early productiveness of the trees. This early bearing is a great desideratum in a new country, and with an impatient orchardist, as a matter of financial calculation, it is also a question of some moment. As a general rule, the more thorough the culture of the young trees, the more rapidly they are developed, the sooner will the orchard be brought into a productive state, yielding the largest returns. But this production of wood-growth must not be encour-

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aged too long, since it is the antagonist of fruitage. In some places it has been found necessary to check this excessive wood production by discontinuing the cultivation of the soil, and laying down with blue grass, which makes a close sod, and checks the growth of the trees—forcing them into a fruiting condition. Every one must decide for himself whether the orchard of larger trees, capable of bearing larger crops, at a later period of their existence, is to be preferred to that containing smaller trees, bearing a crop within a few years from planting, and continuing to be productive for a long time, even though the trees should never attain the large size that is so much admired, nor continue to be productive so long as the other. In our age and country, *the now*, the immediate return of profit from the investment, is the great desideratum with most of us, and many people will prefer to treat their orchards in such a manner as to insure early productiveness, trusting to the future for the supply of fruit for future years. On this account, we find that the early producing varieties are always inquired after, and often preferred, though the fruit be of inferior quality to that produced by trees of the varieties that are longer coming into bearing.

This antagonism between wood growth and fruiting was pointed out by the great Humboldt (in his Aspects of Nature, p. 285.) He says: "Unfruitfulness is to a plant prolongation of life." He also quotes Agardh, who ascribes shortness of life in herbs, or such plants as are not trees, "to the preponderance of the production of flowers and fruit over the formation of leaves. Endlicher tells of a plant of medicago sativa, which was not allowed to fruit, that lived eighty years. The *Reseda Odorata*, or Mignonette, which is naturally annual and prostrate, has been made to assume an arborescent form, and to become almost woody, by pinching in its flowers until it assumed the desired form, and then it would continue to grow and blossom almost indefinitely, provided that the seed was constantly removed.

A plan for making an orchard without transplanting the trees has been suggested, and to some extent practiced by nurserymen. Certain trees in every third or fourth row of the nursery are selected and treated for the future orchard. They are branched low and pinched in. When the square nursery of trees is sold and removed, these selections are left in the ground, and with many varieties they are ready to commence bearing at once. They have received no check from transplanting. Their roots are perfect, and from the cultivation among them they are well supplied with

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its first fruit.* It may be objected to this close planting, that the trees will be so crowded in a few years that they will injure one another. In reply, it is urged that every alternate tree can be removed at any time, to allow the others to expand; also, that the use of the root-pruning plow will keep the trees from growing too large, and lastly, that the early productiveness and continuous bearing of such an orchard may justify its destruction after a few years of fruitfulness, where another is coming on to supply its place. Some persons consider the transplanting of the tree so unnatural a process, and so injurious to its vitality, that it should never be practiced, but that the seeds should be planted in the stations of the trees in the future orchard, and never disturbed except to bud or graft them with the desired varieties. This plan, in the case of certain seeds, might conduce to greater longevity, but this does not follow as a matter of course, because it is known that some seedlings are short-lived, as well as tender, nor is it admitted that the transplanting of a tree is so injurious as is claimed by those who object to the process.

When the orchard has acquired a sufficient growth, and has assumed its condition of maturity and fruit-bearing, it no longer requires to be cultivated perhaps, but is better if let alone; having been laid down to clover, it should be made use of as a hog walk. No other stock should ever be permitted to set hoof on the soil. The swine alone should be allowed to crop the clover and to consume the fallen fruit, thus destroying immense numbers of insects, they will help to keep these pests in check. They will distribute their droppings over the surface, and may even be allowed to root, to some extent, with their snouts. Should the weeds make their appearance, they may be mown and left upon the ground, or otherwise about the trees as a mulch; but with the close planting that is now generally recommended, and with the low-headed trees that are so very much preferred by all who have had an opportunity of observing their advantages, there is really little space left for any crop among the trees, except grass, and this will scarcely grow beneath them in the thick shade of their boughs.

Shall an old orchard ever be plowed? is a question often asked by those who have neglected their trees, and who have allowed a dense blue grass sod to take possession of the surface of the ground. Under such circumstances, the trees have been exhausted by producing for years an excess of blossoms and fruit, and having ceased to make any thrifty wood-growth, they may need cultivation of the soil to incite a new and vigorous growth of wood and foliage. They will also require, at the same time, a severe but judicious winter pruning. The plowing of an old orchard, however, is not unattended with danger, and should be well considered, since some orchards have been ruined by this treatment, especially where deep

*Practice of A. R. Whitney, Franklin Grove Nursery, Lee county, Illinois.

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plowing has been practiced, on shallow soils, so that the main system of roots has been extensively injured. It were better far, to avoid the necessity for this treatment, and it is believed, that by a suitable course, this treatment might not have been required. The proper cultivation of the young trees does not injure the roots materially, and it preserves the soil in a condition most favorable for their renewal when broken. In an orchard that has been thus cultivated, on suitable soils, there will always be a system of roots below the usual reach of the plow—these are permanent. This is not so much the case where, by mulching, or otherwise, the roots have been brought very near the surface, when thorough plowing may seriously injure the trees, by too much breaking and tearing these important organs, and nothing but surface culture should be attempted. There, as in some other cases, the less of two evils must be chosen. But there can be no question as to the propriety of culture, even by the plow, in the condition supposed—that of an old orchard, showing signs of decrepitude from exhaustion, from neglect of pruning and of proper care of the trees, standing in a grass-bound soil.

Generally speaking, the damage that may ensue by breaking the roots by the plow will be more than overbalanced by the renewed vigor that will ensue, especially if accompanied by thorough pruning, removing the dead limbs, thinning out those that are too close, and even shortening in those that remain, at the same time scarifying the old bark, and washing the trunks and limbs with weak alkaline solution. Such treatment will almost always insure the rejuvenescence of the trees, which will then push forth new roots, where the plow had broken the old ones, and new healthy shoots and fine foliage, followed by good crops of excellent fruit. If the soil be thin, either manure or lime, or both, may be applied with excellent effect. So then, we may conclude, that with these adjuvants, the breaking up and after cultivation of the soil in an old exhausted orchard, will be of the greatest advantage.

Mulching has been highly recommended, and where practicable, is a most judicious, useful and satisfactory treatment—but is it a practicable application to the large orchard? Whence is the mulching material to be obtained? Large orchards are not often closely

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results, and the desirableness of mulching cannot be doubted by any one. It is only as to its practicability that we are forced to raise a question—when considering the propriety of its application to a large orchard.

The effects of mulching are two-fold, retaining the moisture in the soil, by protecting it from the sun and wind, and in some cases abstracting gaseous matters from the atmosphere, and retaining them in proximity with the earth as food for plants. The roots are brought up to the surface in search of their pabulum. Now, to secure these results, it is important to have the proper materials for mulching. Blue grass has been suggested as a mulch—not the mown blades, that are excellent as a temporary application, in a small way, about lawn trees and shrubs, or among strawberry plants at the time of their ripening—not this true mulch—but a living turf of this closely growing grass over the whole surface. (Vide Trans. Am. Pom. Soc., 1858.) In such a condition, it is no mulch at all, but on the contrary, it occupies the soil, robbing the trees of moisture as well as of food. Clover, on the contrary, may be considered a mulching material, in every sense of the word, and though not so good a mulch as some other substances, it is one of much more practical application, particularly for extensive use. The clover plant strikes deeply into the soil in search of its food. It is generally a biennial, and as the plants die out, they leave an abundant supply of vegetable matter in the soil, which may be useful food for other plants, and at least they render the soil open and porous for the admission of air. The foliage is broad and abundant, shading the soil, and thus protecting it from a too rapid evaporation—preserving its moisture, and at the same time, by its peculiar, radiating surfaces, attracting from the atmosphere copious deposits of dew to add to the moisture of the soil beneath.

The fact is, or may be familiar to every casual observer, that the great objects of mulching are effected by allowing a crop of clover to grow and rot upon the land—the soil is enriched, it is kept moist, it is rendered loose and friable; the annual seeding of the crop keeps up a spontaneous reproduction of the clover, to replace the old plants as they die out. This treatment may be continued for years, or until the shade of the trees has caused the clover to dwindle away, or until the natural and permanent blue grass has taken possession of the surface, to the exclusion of the introduced legume.

All trimmings of the trees, as well as the leaves that are annually cast off from them, should be allowed to remain upon the surface, even at the expense of being considered slovenly, because

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which is less quickly frozen than where it is not so protected; then again, the shade prevents the constant thawing of the frozen ground, which is very trying to vegetation, particularly on runny soils. The winter advantages of mulching are most especially furnished by clover lay, which affords an excellent protection from frost, except in the most severe weather.

The objection to a winter mulching is, that the materials generally applied encourage the field mice, which often injure the trees by girdling the bark. This can only be prevented by tramping down the mulch, and by removing it from immediate proximity to the tree, or by applying some material to the bark that will be disagreeable to these animals.

In conclusion, allow me to repeat: Never neglect your orchard, after having planted it. This is the *no-culture system.*

Cultivate thoroughly, while the trees are growing. Use such crops as will not interfere materially with the trees. Hoed crops are to be preferred.

Alternate with clover for a mulch, and to be plowed in as a manure, when the culture is to be resumed. When established, clover may be sowed and allowed to continue, and even blue grass.

Low heads and thick planting prevent the necessity of culture eventually, and then their own shade and fallen leaves constitute the best and a natural mulch for the orchard.

ESSAY BY S. G. MINKLER.

Mr. President, and Members of the State Horticultural Society:

The apple, the world's renown of fruit, loved and desired by all, soon to come within the reach of the millions of the West, so conducive to the health and comfort of our families, and the entertainment of our guests, should receive better treatment, and closer attention in its cultivation after it is removed to the orchard.

We will speak first of the *aspect.* We cannot always have a desirable location for our orchards, naturally, for the reason that the orchard should be contiguous to the dwelling. Therefore, in some instances, we have to accept ground that, naturally, is unsuitable for the orchard, without some artificial means are employed to prepare it. Probably the best mode is to underdrain with tile; and the next is the mole ditcher; and if neither is at hand, lay off the land the distance you wish to set your trees, and plow so as to leave a dead furrow where you wish your trees to stand. Then commence back-furrowing in the dead furrow until you finish your land. The object of this is to till the land deep, and also to form a ridge where the trees stand. By so doing you sub-soil three or four feet where the trees stand, and the remainder can be subsoiled the next year after planting. Previous to the winter of

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1855 and 1856, I dug large borders some two and three feet deep, and four feet across. I found, in removing the trees killed by that winter, that the roots had not penetrated to the bottom of the borders, but had radiated far above the base of the border, and that those deep borders (or holes, if you please to call them) had served as reservoirs of water on clay sub-soil.

I believe it indispensably necessary to well drain all clay sub-soil lands. And this may be done after the trees are planted, if it cannot be done before. I have used the mole ditcher between the rows in the lowest grounds in my orchard with good effect. I think it sufficient to properly drain the land, and intend to have the whole orchard so drained, both on high and low land.

Of course it is understood that there must be descent enough to carry off the water. If not, such grounds should not be used under any circumstances. But when it is practicable, choose the highest location on the farm, and any other exposure in preference to a southern one. My reason for this is, in the spring the trees do not start quite as soon, and late frosts in the spring will settle on a southern slope before they will on a northern. And the same rule holds good in the first of autumn.

The distance Apart to set Trees.—I think in a former essay I gave the distance two rods. I am of the same opinion still, where we plant all the varieties promiscuously. My experience is, that the roots of well cultivated trees will meet in six to eight years. But were I going to plant the slower growing kinds, a less distance would be advisable.

Planting.—There has been so much written about transplanting, it appears to me it must be perfectly understood. But I must urge the necessity of staking—yea, the *importance* in our windy climate. Drive your stake on the south-west side of your tree, one foot from the tree. Three feet above the ground is sufficient length for the stake. Make a band of straw, or of slough grass, which is better; twist it hard; place it first around the tree, place the two ends together, twist them firmly about ten or twelve inches, then open the band and place it around the stake, and tie firmly. The object of twisting the band between the tree and the stake, is to prevent the stake from rubbing the tree. The stake performs another very important function: it prevents the whippletrees from barking the trees. The bands will need renewing once a year for two years, when the tree will be sufficiently established to do without stakes.

The next important item in orchard culture is *mulching*. This may be of chip manure, old straw, or half-rotted manure. Place around the tree of sufficient thickness to keep the ground moist during the whole season. Extend the mulch a foot and a half beyond the roots. But if this mulching is of straw, in the fall there should be a shovel full of dirt put around the trunk of the tree, and packed firmly, to prevent mice from barking them. Remember, mice work under cover, and their depredations are often charged to the rabbit's account.

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But this applies to spring planting. Fall planting (which I prefer) does not differ from spring planting only in this—there should be a mound from eight to ten inches around the trunk, and that leveled down in the spring, and the mulching applied.

SELECTION OF TREES.—Select those only that have their branches well distributed on every side, without forks or crotches, *with low heads.* I am more than ever convinced of the necessity of this.* Whenever I can get the branches to shade the trunk, I consider the tree safe from being killed by the hot sun in summer, and thawing and freezing in winter upon the south side of the tree.

VARIETIES.—Choose those recommended by this Society, and you will be perfectly safe.

CULTIVATION.—It is astonishing to see so little attention paid to the cultivation of the orchard. I recently noticed the orchards in traveling thirty miles, and I found three-fourths of them seeded down, or sown to small grain; and many of them one and two year's standing. *No wonder* that people complain that this is not a fruit country. What would you think of a man that seeded down his cornfield as soon as he had planted it? There is just as much propriety in the one case as the other—sure death to both. But when people learn to have as much regard for an apple tree as they do for a hill of corn, I think this will prove to be a fruit country. The orchard should receive thorough cultivation with any hoed crop. Corn is preferable. The stalks should be left standing during the winter, to protect the trees from the wind. It should not be seeded down under the age of ten years, and then only at short intervals, and the crop not taken from the ground.

USE OF MANURE.—I am in favor of using manure on the orchard, as well as on other lands. But it should not be used in planting, nor come in contact with the roots; for the reason that it is liable to scald them.

TAXING NURSERY STOCK.

C. R. Overman, of Bloomington, moved a suspension of the rules to discuss the propriety of the taxation of nursery stock. He wanted an expression of gentlemen present as to the practice in this matter in different parts of the State. The assessor here insists upon assessing our nursery stock, which we regard as a growing crop. Will gentlemen tell us if their growing nursery stock is taxed?

Arthur Bryant, sr., Princeton, Ill.—The only instance within my knowledge, was the case of Spaulding, in Lee or Ogle county.

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This whole mattter was discussed by the Northwestern Fruit Growers' Association. Wm. R. Prince, a gentleman somewhat extensively known, and an intelligent man, whatever else may be said of him—said he had paid considerable attention to this subject, and asserted that both by common law and practice, nursery stock is exempt from taxation.

J. G. Hoffman, Crown Point, Lake county, Ind.—Was once taxed for nursery stock. It was claimed as personal property.

N. J. Colman, of St. Louis, offered the following resolution:

Resolved, That it is the unanimous experience of the nurserymen of this Society that their stock has not been taxed.

Adopted.

On this subject of the taxation of nursery stock, Dr. John A. Kennicott, of The Grove, Ill., wrote to the Society under date of Nov. 30th, 1862, as follows: "I am not satisfied with the decision of the Commissioner of Internal Revenue, in taxing only *one branch* of productive agriculture! If the nurseryman must take a license to sell his plants, why not the grain grower? I can see no difference—both alike are cultivators of the earth for the purposes of production, and both sell the products of their land and labor. Will you not inquire into this discrimination? So far as the *tree peddlers* are concerned it is all right, but I protest that in the case of the producer, it is an unjust discrimination."

This communication was referred to a committee, consisting of G. W. Minier, Smiley Shepherd and John P. Reynolds, who reported as follows:

"That the taxation of nurserymen, by requiring them to take out license for the pursuit of their specific calling, is not founded upon any just distinction between them and other agricultural producers. If any branch of productive agriculture is to be taxed in this manner, we can see no good reason why all should not be.

"Neither of the members of your committee is a nurseryman, and we cannot understand why our plants and immature horticultural products may not be subjected to taxation with as much propriety as those of nurserymen. By our State laws all "growing crops" are exempted from taxation, and in practice all productions of the nursery are regarded as such.

"Your committee, therefore, recommend that the Commissioner of Internal Revenue be requested to reconsider his decision in the premises, and so modify it as to avoid what seems to be an unjust discrimination against this important interest."

WHITE WILLOW—*Salix alba* (*Gray.*)

The Society held a lengthy discussion upon the proper name for this tree, which is known as "White Willow," "Gray Willow," "Timber Willow," "Powder Willow," etc., etc., which resulted in the appointment of a committee to report upon the name and distinctive characteristics of this Willow. The following is the report of the committee:

It is well known to those who have examined the subject, that the Willows are a very numerous genus, embracing, according to different botanical authorities, a large number of species. These are sometimes found to be synonyms—one of another—so that there

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has been a reduction in the number; others have been decided to be only sub-species or varieties, so that the family group has been still further reduced. The botanist, Asa Gray, to whom our countrymen are indebted for the best systematic treatise upon the plants of North America—native and adopted—has reduced the species to the number of twenty-two.

It is also well known to those who have attempted to analyze a specimen of this involved family of plants, that it is exceedingly difficult to identify any given specimen without having the plant before him in a growing state, and at the appropriate season of the year, so that the different organs may be critically examined and compared.

According to the classification of Gray, which is the best with which we have become acquainted, and which he credits to Mr. John Corey, we find the *Salix alba* belongs to that section of the Willows which is characterized by having long and loose pedunceled catkins, (blossoms on a thread,) that are borne on the summit of lateral leafy branches of the current season's growth. Of these, the scales are greenish yellow, more or less hairy, and falling before the pods are ripe. The filaments (threads or stems of the stamens) are slightly united and hairy below. These shrubs and trees have lateral branches which are brittle at the base.

The following is the description of this species, the *Salix alba* of Linneas: "White Willow, the leaves are lanceolate or elliptical—lanceolate pointed, toothed—clothed more or less with white and silky hairs, especially beneath—stipules (the appendages on each side of the base of the leaf stock) are lanceolate—the stigmas (the top of the pistils or female organs) are nearly sessile, thick and recurved."

Mr. Gray embraces in this species the Golden Willow (*Salix vetellina*) of Smith & Borrer, the *Salix pamaschiana* of Barrat, and the *Salix coerulea* of Smith, which he finds specifically indentical, and has arranged as varieties only of *Salix alba*. These belong to the subdivisions, which have the *ovary sessile and smooth, and two stamens.*

This tree is a native of Europe, but has taken very kindly to the different soils of our country. It is of very rapid growth, and makes a tree of 50 to 80 feet in hight. In using botanical terms and titles we have not desired to mystify you, but merely to apply the precise language necessary for the description, and must remind you that the common names of plants are constantly liable to be applied by different persons to very different plants, and hence liable to produce great confusion; hence the necessity for the use of the precise terms and botanical names.

In conclusion, we wish to say that so great is the difficulty of distinguishing the White Willow, in the state of cuttings, from other species, and such the consequent danger of imposition in their sale, that those who plant cannot be too cautious in regard to the source from which they obtain their supplies.

DR. J. A. WARDER,
A. BRYANT,
C. R. OVERMAN,
Committee.

The report was unanimously adopted.

The discussion upon the adaptation of the *Salix alba* for shelter, timber and live fence, was very lengthy and interesting, being participated in by a score of members who had been familiar with its uses in this country, in England and Germany. To transcribe all this discussion, verbatim, as reported by the secretaries of the Society, would swell this volume beyond the limits prescribed.

The following is a careful compilation of the testimony adduced and the facts and decisions arrived at by the Society.

Specimens of this Willow were exhibited by J. Huggins and others, which were identified by all the members acquainted with it by the names above given.

SALIX ALBA (*of Gray*) FOR TIMBER.—This variety grows more rapidly than almost any other known to members. Is well adapted to both high and low ground, even growing on land covered with water a considerable portion of the year; is upright in its habit, making a large tree eighty feet in hight, with trunk three feet or more in diameter; is straight grained, splits freely, and is, therefore, readily made into rails or firewood; lasts well when kept from the ground. It has been used in England for fence posts,

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which proved very durable when prepared by soaking them in a brook for three weeks before setting. It makes good "hewing timber" and sawed lumber. There was a difference of opinion in respect to its value for shingles and weatherboards or "siding," some maintaining that when exposed to the rain it would wear out too soon to prove profitable for such uses. It was conceded that it bears a good polish from the plane, and if well painted might prove durable.

Mr. Overman said it did not warp when exposed. He hoped the time was not very distant when steam mills would be employed all over the State in cutting this valuable tree into lumber. He had known it since a boy, and believed it nearly as valuable as pine for most purposes to which that tree is applied.

Several members testified that the wood was much valued for the manufacture of wooden ware. It was well known that Dupont uses the charcoal of this tree in the manufacture of the finest qualities of gunpowder. In Germany the low lands are sometimes planted with it, and after nine or ten years a portion is cut each year for fuel. After cutting, it sprouts from the stump, and in three or four years may be again cut, and so on for a long term of years. It was said that one acre thus treated would yield 17 cords of wood annually, or 160 cords if all taken off at once.

As a shelter for stock, a screen for the protection of growing crops, orchards, etc., it was unanimously approved as perhaps the best or most available of all deciduous trees, though some of the members expressed fears lest by giving too great a prominence to this tree, other well known and truly valuable varieties would be neglected; for it was thought not safe to trust entirely to *any one variety*, lest some destructive insect would appear which might prove as fatal to it as the borer has to the Black Locust.

Mr. Edwards and others, who indorsed nearly all the recommendations of this tree, insisted that the Norway Spruce is the best of all trees for *permanent protection*.

Dr. Warder described two insects which prey upon the White Willow: "One of them, the *Hyphantria textor*, or fall web-worm, is a gregarious caterpillar. These insects appear in groups of two hundred, cutting off the leaves of the trees, defacing their beauty and stopping their growth. They should be destroyed on their first appearance, as they multiply rapidly. They may be easily crushed. These insects are of a grayish color, an inch and a quarter in length."

"Another worm found upon this tree is the *Clostera inclusa*. This worm begins when very small by sewing the corners of the leaves together. It folds five or six leaves together in the shape of a funnel, which will be found near the end of a limb. Take this bunch of leaves off, and you will find a gray worm, having a black wart on the fourth and eleventh rings, by which it may be identified."

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Mr. Bryant said that he had known it infested by a gigantic aphis, of a reddish brown color, which feeds upon the sap, and stops or checks the growth of the tree.

M. L. Dunlap offered the following, which was adopted without discussion:

Resolved, That we recommend the White Willow, "*Salix alba* (of Gray)," to the several railroad companies, within the snow-line, as valuable to plant along all portions of their roads subject to snow-drifts; that in its rapid growth it will form the most valuable protection for this purpose.

SALIX ALBA (*Gray*) FOR LIVE FENCE.—The testimony upon the adaptation of this tree to making live fences was confined mainly to observations and experiments in the northern counties of this State. This testimony was clear and explicit, all going to prove that the fence from this tree is a perfect barrier against all large animals, being formed from the trunks of the trees, planted in line. The distance recommended for planting for this purpose varied from one foot to one and a half feet—the former making a fence quicker, but the latter being more valuable when older, on account of its stronger growth.

A vote was taken that eight inches is the proper length for a cutting. This was based upon the fact that cuttings succeed best when only one or two buds are above the surface. It was recommended to plant cuttings in well pulverized soil in the fall, covering them a few inches in depth with straw or litter, which must be removed as soon as frost leaves the ground in spring. If planted in spring, they should be planted early, since the cuttings commence growth soon after the frost is out. Cuttings should be taken off in autumn, or early winter, and buried in boxes in a dry place, or kept in moss or saw-dust, in cellar, for spring planting.

It was said to be necessary to protect the young trees from sheep, cattle and horses, until large enough for a fence, as they all will feed upon the young shoots. All agreed that it was necessary to cultivate well, and take pains to secure an even stand, and a uniform growth, to have a perfect fence.

This tree does not throw up suckers from the roots, like the locust and poplars. Timothy and blue grass will grow well close to the fence or screen, yet owing to the roots of this tree lying near the surface, the plow cannot be used nearer than sixteen or twenty feet of fully grown trees. Testimony was given to show that crops of cereals were so much improved by the protection which these fences give, as to much more than repay the loss near the fence; beside, these borders were needed as head lands, driveways, or they would yield a fair crop of hay. Members objected to the use of this tree as a fence around small lots and gardens, and but few would use it where *only a fence was wanted*, in those localities where the Osage Orange succeeds well. It was shown that this fence could be cut off at from six to ten feet from the ground (as when grown for fuel, etc.,) without any injury to the trees, cutting

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at each time as near down to the last cutting as possible. Two gentlemen stated that they had known trees which had been cut off in this manner once in two or three years for the last *fifty* years, without any apparent loss of health or vigor in the tree.

The following resolution was unanimously adopted, viz:

Resolved, **That we recommend the *Salix alba* (of Gray) as suitable for a live fence, where shelter, timber, and a fence *combined,* is required.**

GRAPE CULTURE.

By Dr. C. N. Andrews, of Rockford.

The mission of the Illinois State Horticultural Society is one of much importance. Our State, an empire in extent, rich in soil as any land the light of heaven ever rested upon, is, comparatively, yet in its infancy. A very large proportion of our lands remain uncultivated; and where they have been brought under cultivation, fruit culture has not received that attention that its importance demands. Many who have commenced fruit growing have failed—some from one cause and some from another. As a consequence of such failures, many others have been deterred from commencing at all. The result is, that many farms and gardens are either entirely destitute of fruit, or are without an adequate supply. Fruit should be raised both as a matter of economy and as a source of profit; and that it is not only a luxury, but an indispensable necessity, all will admit. Hence it is the duty of this Society to designate and recommend the kinds of fruit, and the varieties, adapted to our soil and climate, and with the philosophy of political economists and conservators of the health and well-being of our people, to urge upon them the necessity of their being cultivated. In pursuance, therefore, of such considerations, I desire, briefly, to call the attention of the Society to the Grape, that the importance of its being generally introduced and cultivated may be duly considered, and such recommendations made in regard to it as may be deemed expedient.

In the very pertinent and truthful language of a recent writer* of much intelligence, upon grape culture, allow me to premise that: "It may be regarded as a highly interesting and gratifying evidence of the progress of civilization, on this continent, that general attention is turned to the cultivation of the grape and manufacture of wine. The newly awakened interest in this subject is manifested in the number and variety of books upon grape culture, which have appeared within the last few years;" "in the space devoted to it in the agricultural periodicals of the country, and in the numerous graperies and vineyards which have been planted within the same brief period. There seems to be a general recognition of

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*Daniel R. Goodloe, Esq.

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the fact, that in the scramble for wealth and the greed for wide possessions, as well as in the inherent difficulties of our situation—thrown as we have been upon a new continent—we have too long neglected one of the most ancient and useful arts of life; an art which has been in all ages the fruitful source of comfort and luxury, of health and happiness, to the masses of mankind. The neglect of this important and beautiful department of agriculture is the more remarkable since our country embraces every degree of latitude and every variety of climate and soil in which the grape is known to flourish. The indifference and apathy which the American people have hitherto manifested on this subject can only be explained by a reference to the fact that we have sprung mainly from that country of Europe which, because of its moist atmosphere and cold climate, has given least attention to grape culture. Great Britain lies north of the fiftieth parallel of latitude, where it is next to impossible to cultivate the vine in open air, except in favored spots; and while our English ancestors knew little of the culture of the grape, their government adopted an unwise system of taxation, about the period of the settlement of this country, which deprived the masses of the use of wine, and compelled a resort to alcoholic or malt liquors. That these coarse and strong drinks are the cause of a degree of brutality and drunkenness, not to be seen in wine-producing countries, is the universal remark of travelers."

In regard to wine, I think all will, or at least do practically, admit that it is a necessity. As to the extent that it may or should be used, there is some difference of opinion. It is thought by many of the most intelligent medical men in this country—and in this opinion I fully concur—that the premature decay of youthful bloom and strength of womanhood, so peculiar to American women, is owing to abstinence from the use of those generous drinks with their meals—such as domestic wines and beer—which the women of nearly all other civilized nations use. Tea and coffee, aside from the small quantity of nutritious matter they contain, impart to us little more than the stimulus of heat; neither do they materially aid us in withstanding the rigors of our climate, or atmospheric vicissitudes; but, on the other hand, by their relaxing effect upon the perspiring vessels of the skin, often render us more liable to suffer from exposure.

It is a fact to which we cannot close our eyes, that wines (or

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ous as wines made from grapes, which contain a less quantity of acids and the saccharine matter, peculiar to this fruit, in sufficient quantity to make wine without the addition of cane sugar.

The wines which we buy as imported grape wines are mostly spurious imitations. Thieves pick our pockets directly, and in a majority of instances their confederates make for us our grape wines from poor whisky, logwood, and so forth, and thus pick our pockets indirectly, and frequently nearly poison us in the bargain. We buy their "wines" at great prices, use them for sacramental, medicinal, and hygienic purposes, knowing all the while the impositions being practiced upon us; but yet we do not encourage the only effectual method of correcting the evil—which is by growing our own grapes and making our own wine—lest we might possibly, by so doing, encourage the great evil of intemperance.

Can grapes of the first quality be grown in this country? We have been made to believe, or have fancied, that good grapes could only grow on some distant isle of the ocean, or in some oriental land where "soft and balmy breezes ever blow, and genial sunshine ever gilds the landscape." We have associated this fruit with the castle-crowned hills of the Rhine, the high cultivation and finished civilization of France, the sublime and picturesque scenery of Italy, and with all the fabulous elegance and luxury of the Eastern world, and have felt that our continent was too rude, too earthly to bear, and we too plebeian, or a too matter-of-fact people to cultivate it. We have therefore gone to our swamps and jungles, and with great philosophy contented ourselves with eating such grapes as wild nature there had produced—just such grapes as, in very ancient days, according to Calmet,* did grow in Palestine, "*without culture, near the highways and hedges, whose fruit was a very small grape when ripe, but often it did not ripen at all.*"

There are, however, but few persons, even in this vine-neglected country, who have not, at some time or other, planted a grape vine; but as yet very few, comparatively, have obtained good fruit, while the majority, for reasons quite obvious, have obtained none at all; and I think I may safely say that not one in a thousand of our people have ever tasted, or have any just conceptions of the qualities, of a first rate grape. But shall it continue to be that this fruit which, when well selected in variety and grown in perfection, is delicious above all other fruits, wholesome above all other fruits, adapted to a greater variety of economic uses than any other fruit, which may be the rich man's luxury and the poor man's profit; which may be made to grace the apple-yard of the farm-house, or beautify the grounds of the suburban mansion; which may be grown by every person who has one square rod of ground to cultivate, and which, I think, may be made more remunerative in its cultivation than any other fruit; whose delicious qualities, in all

*See Goodloe's History of Grape Culture.

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ages, historians have related and poets sung, while Jew and Gentile, philosopher and cynic, stoic and epicure, and Christian and heathen, have vied with each other in its praise, and whose luscious juice claimed the miraculous power, and was finally made to commemorate the shedding of the blood of our Lord Incarnate, shall remain unknown to us except in story or fable?

In order to succeed in growing the grape in this country, I am of the opinion that the system of culture hitherto pursued must be entirely revolutionized. The idea that the grape cannot be grown upon the ordinary soil that the Almighty has prepared for the growth of plants and trees, but that it must have a bone-yard for a border, reeking with the foul decompositions of every sort of animal and vegetable matter; and that their roots must be planted and encouraged to grow so far down as to be wholly beyond all supernal influences, must be abandoned and forever entombed with all other laughable follies of the past. We select all choice varieties of other fruits, whether originally produced in this country or in the Old World; and we plant them in accordance with rational principles, and they grow and yield abundantly. We find nothing in our climate so noxious or blighting, or in our soil so deleterious, as to prevent such growth or yield. But when we procure the best varieties of grapes, (and for such we have had to depend mostly on importations, for as valuable as several of our natives are known to be, it is not yet fully determined whether we have a first rate native grape when compared with those of foreign origin,) and plant them according to the old system above referred to, they grow rampantly at first, and give great promise, but at length they mildew, rot and die. Such has been the experience of so many, that it has become, with nearly all, a foregone conclusion that good grapes, and especially the foreign varieties, though brought from the same countries from which our best pears, peaches, cherries, and so forth, are brought, cannot be grown here unless we build a house for them to grow in. Fortunately a few experiments, made almost accidentally within the last few years, disprove, at least in part, the correctness of such conclusions. A gentleman in Michigan erected a vinery, and expended a considerable sum in making a vine border according to the old system. The vines planted in it (which were foreign) failed entirely, whereas a few refuse ones, planted carelessly in common garden soil, grew healthily and yielded fruit of first quality. A young Scotchman, wholly inexperienced in grape culture, emigrating to Illinois, received, as a present from a gentleman in Boston, a few roots of choice foreign grapes. These were planted on the bluff, in the western suburbs of Rockford, without any extra labor being expended in repairing or enriching the soil, and they have borne fruit of good quality for the last six or seven years, with little or no care, except being tied up to stakes, and such pruning as the frost from year to year gave them. Six or seven years ago I had ordered some foreign grapes with the

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view of planting them in a vinery. They were sent to me out of season, in bad condition, and when I was not prepared to receive them. I planted them out in common garden soil. They all died but two; one of these was attacked by the spider, and thus kept back from year to year, till last year, when it made good wood which ripened a good quality of fruit this year. The other grew well from planting, fruited the third year, and has borne enormous crops every year since. It has ripened its fruit earlier and borne a much greater quantity than any native vine in my garden.

In consequence of our having so often failed in our attempts to grow foreign grapes, we have fallen back upon native varieties, and we have at length, it is true, produced several of these of great excellence; but as yet we know but little more of their real merits respectively, or the adaptability of each to the different sections and localities of our country, than we do about those of foreign origin. Therefore it must appear evident to all, that nearly the whole field of our investigations upon grape culture in our country lies before us, the past being of but little value to us except as a record of our failures. And must we now, in our observations and experiments, confine ourselves wholly to vines of native origin, or may we make additions to our small list of good native varieties from the many hundreds of those old foreign ones which have been grown for ages upon the hillsides of Europe, where frosts are as severe and the winters as bleak as ours, and for the products of which we are annually paying our millions?

I am of the opinion that the richest field now open to the industry of American horticulturists lies in the transfer to our soil of those better varieties of grapes grown in the highest latitudes of Europe, in which grapes of good qualities will grow in perfection. And I should here add that the United States Patent Office will render us very important aid in this matter, if we will but avail ourselves of it.

I apprehend that one great cause of our failures with foreign grapes has been, that the varieties which we have experimented with have been mostly procured from British vineries and forcing houses, where they have been grown so long that it is with great difficulty that they can be made to grow anywhere else. Several varieties that we have experimented with were originally produced there, and never have been made to grow in the open air at all. What would have been our success if we had selected our varieties from the terraced hillsides of the continent, and had given them just such cultivation as we have given to other imported fruit?

In regard to growing the grape, Mr. William Bright, in his recent work on grape culture, very aptly remarks that "it would seem to be a simple thing to grow a grape vine, to prune, to water and to fruit it, but somehow or other the world has contrived to make a great mystery of it." In order to remove this mystery it is only necessary, I apprehend, to study the nature and peculiarities of the

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vine, and its requirements; and in prosecuting our inquiries in this direction, I think we should lay aside all that brood of theories hatched in foreign vineries, which constitute nearly the sum of our present knowledge of vine culture, as being of very doubtful application to our situation and circumstances. The habits of the vine indicate to us its dependence upon man, and that it was created for a closer companionship with him than any other fruit, for as we extend to it its needed care and support, it fondly climbs over and around his porch or his dwelling, cheerfully and generously yielding its delicious fruit and umbrageous beauty. It is more completely under our control than any other fruit-bearing plant. We make it grow *where* we would and *as* we would, and while the standard fruit tree must weather the rigors of winter, even though it perish, the vine admits of our giving it complete protection; and I do not think there is a vine cultivated in Europe or America that we cannot grow and give perfect winter protection.

The requirements of the vine as to soil are only such as those of wheat or corn. It should be thoroughly worked with the plow or spade, and if the surface of the land is not such as to insure thorough and rapid surface drainage, in both summer and winter, it should be back-furrowed with the plow, at least twice, in such a manner as to form ridges with gutters or dead furrows between them that will readily conduct off the water, and the vines should be planted on the top of these ridges. If the subsoil be wet and retentive, it should be underdrained. As a general rule, our highest lands should be selected, and never a flat surface if it can be avoided. The vine abhors a cold, sour subsoil or stagnant water about its roots. It delights in sunshine, and an open, airy situation. Its roots also, as well as its foliage, like to feel the genial warmth of the sun. Having prepared and thoroughly and deeply mellowed the soil, we plant the vine as we would any other bush or shrub, except we spread out the roots in nearly a horizontal direction. We do not plant it deeply, not more than from four to six inches, for vines deeply planted never ripen their fruit well till they have grown new roots near the surface. If the soil be properly worked, the roots will penetrate as deeply as they should ever go. Neither do we add water in planting, or tramp the earth upon the vine roots. We leave the soil as loose and mellow as possible, that the growing roots may ramble through it with perfect ease. We now prune back the vine to a single eye or two. Why? Because we wish to force all the growth of the vine into one good, well matured cane, and not into a dozen or more small immature branches of no value.

It would be impracticable at this time to describe all the details of pruning. I will therefore merely state the general principle that must be followed, and refer you for details of the different systems of pruning, and for other matters relating to grape-culture, to works upon this subject, such as that of Bright or Phin.

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Firstly, we prune the vine that we may keep it within our reach and control, and also that it may not grow to waste by forming a thousand small useless branches out of place, and that would have to be cut off and thrown away. As its fruit always grows on the branches of the previous year's growth, and never on branches that are not of good size and well matured, we prune from year to year, to force the whole annual growth of the vine into a few, sometimes into one or two shoots, for the next year's fruiting, and during such season while such shoots of the previous year's growth are fruiting, we also grow, from just such points as we wish, shoots for fruiting the following year, always training those, while growing, in a perpendicular direction. Thus, after a vine comes to bearing, we grow both fruit and wood every year, and by pruning out, in fall or winter, the old branches that have once borne fruit, and by keeping dressed out all surplus shoots through the summer, we direct all the growing forces of the vine into just the quantity of fruit that it can mature in perfection, and just the number of shoots that we desire for the next year's crops.

Most varieties of grape, if indulged in an unlimited growth of vine, will very soon set no fruit at all. (In this fact we find the reason why so many neglected vine-clad arbors and trellises all over the country are always barren of fruit.) Other varieties, like the Isabella, would set a great quantity that they might ripen, but it would be of very inferior quality. Other varieties still, like the Catawba, would set a vast quantity that would never ripen at all. The longer the season the greater the quantity of fruit the vine will mature, and the less pruning will be required. Vines that would require but little pruning, comparatively, in the southern part of our State, would have to be cut closely in the northern part. Only a certain amount of saccharine matter can be elaborated by any vine in its fruit. Therefore, if too great a quantity of fruit be allowed to set, it will be slow in ripening, and be sour and insipid. Vines, like corn, should be cultivated and made to do their best work during the warm, growing season. If, for want of proper cultivation, pruning and dressing, they be allowed to idle away this season, they will fail in making up time after the cool nights and strong winds of autumn have injured their foliage; just as late and badly cultivated corn will fail to make a full, sound crop after frosts have killed its leaves. A vine that is so situated that the sun strikes the ground over its roots, will ripen its fruit earlier than if the ground about it is shaded, and if this ground be kept properly cultivated with the hoe and spading fork, so as to admit warm air to penetrate freely around its roots, it will ripen its fruit earlier still.

Vines must be faithfully dressed through the growing season, for these special reasons, which we recapitulate. Firstly, to keep straggling branches from growing where they should not grow; secondly, to prevent the growing of too much wood, to the injury

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of the fruit; thirdly, by pinching back the fruiting branches they may not make unnecessary growth, and by taking off the straggling branches, we may thus force the growth into those branches that we wish to grow and become well matured. By neglect of such dressing, our vines play truant, they grow everywhere where we would not have them grow, a thousand branches grow that have to be cut off because they are out of place, too thick and small, and worthless. And worse than all, these rob the fruit and the branches for next year's fruiting of their proper nutriment, and as a consequence, both of these are badly matured and are of but little value. Another object of dressing that I have not named is, to keep the vine open to sunlight and air, an abundance of both of which fruiting vines must have.

It is a question with me as to how closely the fruiting branches should be pinched back. I am well convinced that the pinching back as ordinarily practiced retards the ripening of the fruit. I have observed also that allowing a fruit branch to grow with its point towards the zenith accelerates the ripening process of both fruit and wood. I suggest, therefore, as an experiment, that when early ripening of fruit is a consideration, the fruiting branches be not stopped, except as it may be necessary to prevent their becoming leaders, or to prevent the vine from growing out of shape.

The habits of the different varieties of vine differ. Each must therefore be specially studied. Some grow rampantly, and indeed almost grow themselves to death—that is, they grow so rankly that they seldom mature their wood, and are consequently tender. Such need to have their growth discouraged in every possible way, and especially by withholding from them all stimulating manures. Others grow feebly, and must have their growth encouraged even from the time of their planting. Some grow compactly and have short joints, and need much thinning of their branches. Others grow openly and have long joints and need but little thinning. Some fruit sparingly, requiring at pruning the saving of a greater number of fruiting canes. Others fruit bountifully, and consequently require the saving of less fruiting canes, and such require also to have their fruit bunches thinned. Some are hardy, while others are tender, and need protection in winter. As the whole pinching-back process evidently prevents the maturing of grape wood, tender varieties should be pinched less than the hardy, ex-

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In our investigations in regard to varieties, attention should be paid: Firstly—To hardiness and adaptability to the climate of the region in which they are cultivated. Secondly—To their season of ripening, as the shorter season of the North will require those which ripen their fruit earliest. Thirdly—To quality; and in regard to this we should not be contented with a single variety of good quality, but we should have a variety of those of good quality to suit the variety of tastes which people have. Fourthly—To the time and length of season of the fruit and its qualities for long keeping, for we want grapes for the different seasons as well as apples or pears. We want summer grapes, and fall grapes, and winter grapes, and grapes that may be kept, if possible, till summer grapes come again. Fifthly—We want to select, also, varieties adapted to the different economic purposes for which grapes may be used, for we want grapes for cooking, for early stewing, for pies, for pickles, for jellies, and for preserving; grapes for raisins, grapes for the table, and grapes for wine; and I think we can obtain varieties that will specially answer each of these purposes.

The question may be asked, what varieties shall we plant? In answer, I would remark, that while there are very many varieties, native and foreign, that are worthy of trial, there are as yet but few that can be recommended from actual experience as being adapted to general cultivation, or especially in Northern Illinois. Of course all the hardy varieties, including all the Fox tribe, will grow almost anywhere; and these must not be discarded, for among them we find many of our best culinary grapes. The Delaware, Concord, Hartford Prolific and Clinton may be planted anywhere without fears as to the result. The Diana and the Isabella will grow anywhere in the State, and yield bountiful crops; but in the northern part must be protected. The Catawba must have winter protection at the North, and as it requires a long season, but few there succeed in ripening it well. The Golden Chasselas, a good foreign variety, I have succeeded well with a number of years. It is quite as hardy as the Isabella, and bears fruit equally as well. I most earnestly recommend the further trial of good foreign varieties in the open air, and especially in the central and southern parts of the State. I am now experimenting with a large number of these. They all grow, thus far, as well in the open air as our natives, and I have not yet found one of them to be more tender than the Catawba. They seem to grow from cuttings with much greater certainty than natives, and are more easily kept in proper shape, are more regular and reliable in all their habits of growth, and visibly show the fact that they have been domesticated. In the northern part of the State nearly all of them require winter protection. But a vine that will grow well and ripen good fruit in any portion of the State, should not for such reason be discarded. For if planted and trained as it should be, and with reference to giving it such protection, this may be done in from one to five minutes' time. The process which I recommend is this: Firstly,

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as the young vine is growing, train it so as to have it leave the ground in a nearly horizontal direction, and rise to the trellis, or stake, in a curved form; then prune in the fall as soon as the frost has killed the leaves, press the vine down to the ground and lay a stone upon it to keep it there, and cover it with earth or any coarse litter. It is time well invested to give even a hardy vine such protection, for it will grow and yield enough better to more than twice repay the investment.

It is a fact that I think is not generally understood, that the roots of a vine are also liable to be winter-killed. If the location is flat and has no surface drainage, and the sub-soil is so close as to hold an excess of water about the vine roots, severe freezing will kill them, and especially all the young roots of the preceding year's growth. This fact, I think, accounts for vines not growing well, or not ripening their fruit in some localities.

I conclude this paper by referring, in a few words, to another important duty incumbent upon this Society, and which has an important bearing upon our subject, and that is, the protection of the people, so far as it is in our power to do, from imposition. Since the attention of the people has been directed to grape culture, a horde of impostors have started up, who travel over the country and sell almost every variety of worthless grape under the name of some popular grape, or some name of their own manufacture, such as the "Washington Grape," the "Connecticut Grape," or the "Hardy Wine Grape," and so forth; and that they may succeed better in their impositions, they fix up a few bottles of very palatable cordials, of some kind, and call it wine from their favorite grape; and they also bottle up a few berries of some fine looking grapes, and assure their dupes that such is a specimen of their favorite fruit. But this is not all. In order to advertise themselves and gain notoriety, they gather specimens of grapes from all parts of the country, from Boston to St. Louis, and from Cincinnati to Milwaukie—grapes that they never raised, and could not name were the labels lost, and come into our State and county fairs and distance all honest competitors and carry away the premiums; and, in the same manner, they purchase wines that they could not name were the labels off the bottles, and enter them, as of their own manufacture, under various names, such as "Native Wines," "Catawba Wines," and so forth, and carry away the premiums and get notoriety, when they never even raised the varieties of grapes from which they pretend their wines were made. At your last State Fair, and at several of our country agricultural fairs, grapes were exhibited by such men, and took the premiums, which were at least two weeks in season ahead of the same varities of grapes grown in a vinery in the same locality in which it was pretended that these were raised in the open air. It is due to all concerned, and especially to all honest buyers and honest sellers, that the remedy for such things be promptly and efficiently applied.

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PRUNING AND GRAFTING THE GRAPE.

Dr. Warder—Grafting the grape is very simple. Growth open, union easily formed. The grafting is done under ground, which favors the union. I seldom use grafting wax—use thread. When stock is strong enough use no thread. Cleft graft. By grafting into wild or old vines we get a vigorous growth immediately. Vines so grafted bore fruit the second year and made wine—first quality of wine. Graft in bits of roots—common wild grape vine roots, or anything.

About Pruning.—The Thomery system is one of the most beautiful things on paper, and one of the most difficult systems to practice. Different grapes require different treatment—different modes of pruning applied. Summer pruning should be first to thin the fruit. Rub off one of two shoots from the same bud—thin the fruit by rubbing out alternate buds, and thinning the wood. Leave shoots about twelve inches apart, with room to develop. Leave two to four bunches on each shoot. To get a new branch for next year, carry up the first and let the others lie. Shorten in the fruit shoots. Don't be afraid of too much foliage. Eighteen to twenty-four inches is best length, with three or four leaves beyond the last bunch.

The lower eye does not produce so good grapes as second and third; take off lateral shoots above first leaf; don't be too greedy to get too many grapes. We use suckers for spurs, not for bearing wood.

(See Patent Office Report for 1856, for Warder on Pruning the Grape.)

Dr. Schroeder explained the bow system of training, and gave the following as the amount of fruit different vines bear. A vine three-fourths of an inch in diameter will bear three lbs. of grapes; one inch in diameter, five lbs.; one and a half inches, seven lbs.; two inches, fifteen lbs.

Dr. Andrews—No rule will apply to all grapes. Thomery's system is impracticable as applied to any native grape I have worked with. It operates better when applied to some foreign grapes. At Rockford we must prune to *mature* grapes. Such grapes as the Catawba, by this means, can compete with Cincinnati in the production of this fruit for table purposes.

I let lateral spurs grow; don't cut off. Fruit is not large, but matures. I tie up the fruit-bearing laterals so as to have them grow upwards. They will thus ripen one or two weeks earlier than if trained in any other position. In case of a late fall growth; pinching in may be beneficial.

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WINE GRAPES.

REPORT OF COMMITTEE.

The committee to whom was referred the duty of selecting a list of Grapes suitable for Wine making, beg leave to present the following *Grapes for the preparation of Wine without Sugar*, (except in northern latitudes if absolutely needed):

Catawba, for White Wine, of high flavor.
Delaware, for White Wine, of very delicate and delicious character.
Herbemont, for White and Red Wine, of high character.
Norton's Virginia, for abundance of a very rich Red Wine.
Clinton, for abundant dark Red Wine, of great promise.
Concord, for a Red Wine in great quantity, and of fair quality—promising very well.
Rulander, recommended by Dr. Schroeder and Lewis Koch, of Golconda, Pope county, as a superior Grape for White Wine.

DR. J. A. WARDER, *Chairman.*
DR. H. SCHROEDER.

CURRANT CULTURE.

By J. T. LITTLE, Dixon, Illinois.

Good cultivation of the smaller fruits, by the masses, has, until recently, been considered as superfluous, as waste of time, or rather *small* business; and the currant (from its well known hardiness and ability "to stand grief,") has had to bear more than its share of neglect which the fruit-bearing shrubs are too often made to suffer.

Until the exhibition by tree peddlers, of the cherry and white grape currants, well magnified, the "common people" have been content to believe that a currant was a currant, and with good cultivation, could be made nothing more, and with utter neglect, would be nothing less. But, thanks to the itinerants for opening the eyes of purchasers, at the same time that they depleted their pockets, people have seen that there is a difference even in currants, and the inquiry has gone forth as to what are the best varieties, and what the best method of cultivation.

I propose, in this paper, to give a few plain thoughts upon the cultivation of the currant, and an opinion in regard to the varieties best for general cultivation; and though much that I write may seem simple and unnecessary to the experienced horticulturist, we must bear in mind that the inexperienced need line upon line and precept upon precept, to induce them to do justice to themselves and to their subjects; and frequently "the brotherhood" even, "who know the right, will yet the wrong pursue."

The currant is emphatically the fruit for the million. Its hardiness, productiveness, and the variety of uses to which it may be applied, give it a claim to this position.

No fruit gives a more generous return for good cultivation than the currant; and though it will grow in almost any soil, yet to have really fine fruit the ground should be well prepared by bountiful manuring, with well rotted stable manure, and deep and thorough pulverization. In planting, the roots should have plenty of room,

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that they may be spread out in their natural position, and the earth carefully drawn around them, so that after the ground is settled, they will be no deeper than when they stood in the nursery. No plant or shrub suffers more from cramping the roots and deep planting than the currant.

The planting may be done either in spring or fall; if in the latter season, a small mound of earth should be raised around the bush, as a protection against wind, water and frost.

This fruit requires much more room than is generally allowed to it. For large plantations the rows should be five to six feet apart, and the bushes three to four feet apart in the rows: this will admit of horse cultivation without danger of rubbing off the fruit. Mulching with long straw manure, or fermented saw-dust, is a cheap way ot keeping down the weeds and the ground loose. If the bushes are not mulched they should be plowed two or three times every season, that the ground may be kept loose and the weeds kept down; and in the fall, whether mulched or not, a good supply of well rotted mature should be placed around the bushes, to be worked in in the spring.

The currant is a great feeder, and the difference between fruit raised under the cultivation here recommended and that which it generally receives, will astonish those who have left it to care for itself.

Much has been said about growing the currant as a tree. Like a great many horticultural theories, it looks well on paper and "to the mind's eye," but it is not good in practice. Bushes so grown are short lived. A better way is to allow about three shoots to come out at the surface of the ground, and practice the renewal system. Every three or four years, as the old wood becomes stinted, cut it out; having, the year previous to this operation, permitted three or four young shoots to come out at the base of the old ones, to take their places. In this way the bushes are kept healthy and vigorous, and will continue to bear good crops a great many years.

The heads of the bushes should not be allowed to become too thick, and to make too much wood, so that the branches will interfere with each other. It is well to shorten in the top somewhat in the spring, keeping the bushes in good symmetrical shape. The season of the currants can be prolonged two or three weeks by shading the bushes. It is a very good plan to plant a portion of

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the Victoria and Red Grape, and latest, Gondoin Red; the latter is very acid, a great bearer, and very stocky grower. White Dutch and Gondoin White, though smaller than White Grape, are better bearers and better flavored than that variety.

I have most of the newer sorts under cultivation, but have as yet seen no decided superiority in them over the varieties I have mentioned; and it is with the currant as with other fruits, the cultivator for market wants to plant those varieties which have proved to be good, profitable and hardy, leaving the *fancy* sorts for amateurs.

SHELTER BELTS.

By Hon. M. L. Dunlap.

My theme is certainly a pleasant one, whether in the opening spring, when the birds respond to the laughing zephyrs that first come up from the genial South, to wake them into life—when the birds of passage thrill their first song of greeting to the busy farmer from the yet leafless boughs—when, full robed for summer, they greet the eye in beauty, and their whispering leaves softly breathe to us of love and of home—when surly winter drives his frosty car over the hardened earth—these kindly belts of forest beauty protect the farmer's herd from its withering effects, adding the useful to the beautiful, thus giving to the rolling year changes that never weary—uses that are valuable, and, under all aspects worthy of our care and of our pride. A theme like this will never tire, for its varying beauties are always fresh, from the opening bud, the tiny leaflet, the modest flower, the gaudy catkin, the full grown leaf, waving to and fro under the ardent heats of summer, the changing hues of autumn, or the disrobing for winter.

When God planted the river belts, there was no eye of man to look upon their sylvan beauty, but the wild fowl, the squirrel, and other animals useful to man could appreciate the shelter they afforded from the untoward elements.

Along the Mississippi, the Illinois, and other streams that wend their tortuous way over the vast prairies of the West, the river forests were but ribbons of foliage compared to the wide stretches of open plain, yet these river belts were of inestimable value to the animals that grazed the plain, for they must have shelter during the storms of winter. It was not only a convenience as ameliorating their condition, but an absolute necessity, upon which depended their very existence. Had it not been for this shelter, the prairies would have been solitary, save from birds of passage, and the few animals that migrate as the seasons change. It was then a wise provision of Him who fashioned the land, to plant the wooded belt along the streams, to protect the water courses from a too rapid evaporation in summer—to prevent the thick-ribbed ice

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from cutting off the limpid fluid so essential to the use of animals that should seek winter quarters within the cozy dells of the wooded valleys.

When the Almighty raised the prairies for the last time from beneath the deep blue sea, its surface presented the wreck of wide strewn forests, and the boulders, torn from the granite region of Superior, that the northern iceberg had floated hither. Soon the deep mud of the new exposed surface began to harden, and to form the solid land. Then came the grasses to cover the soil, and make it capable of sustaining life. Along the streams came the woody belt; but these had cut deep valleys in the ooze-like soil, giving them not only the shelter of high banks, but of the sturdy forest, that walled out the winds. The smaller streams followed the example, and along their more sedgy margins uprose the leafy livery of the greater water courses that now drained the land. Next came the out-laying groves—islands of wood in the great sea of prairie verdure—to shade some little rill, a pond, or may be a prairie slough, for you always find water along these belts, and on the west side of these groves, planted by the hand of nature, both so essential to the well being of animal life. Next came the Indian from the North, may be from the plains of Mexico, most certainly from some place where his early education had been sadly neglected. He built his wigwam of rushes under the kindly shelter so wisely provided for him by the All-Father, and made up his scanty meals from the animal, that, like him, had sought shade and shelter in the same genial spot.

Thus nature, or nature's God, had laid out the plan of the country on a vast, magnificent and comprehensive scale. The great sweep of prairies, drained by mighty rivers, meandering streams and gentle rills, whose banks were fringed with belts of stately forest, a sample on a grand scale of what man should do when he came to apply an intelligent system of culture to the soil, or to carve out homes, away from the river belts, far out on the sea of waving grass, with its summer dress of green and russet of autumn, with the dreary winds of winter sweeping over it, fresh from the icy regions of the polar circle.

In this condition we find the country, and after some years of experience, are forced to the conclusion that nature made no idle effort, and if we should succeed, as we ought to, we must follow in the same general principles—to drain the land, to plant forest belts and wooded groves, making our homes but a miniature of the whole country, a mimicky of the plan of the Great Architect.

We will first consider the more general principles and applicability of shelter belts, leaving the subject of draining to another time.

Air Currents.—We all know that the prevailing wind is from the southwest, changing to the eastward before and during the great storms, and, at their close, shifting to the northwest or to the

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south-west. A due north or south wind is but seldom experienced. Orchard and other trees are bent towards the northeast during the summer growth by the steady pressure of the southwest wind, which is almost constant in that direction during the season, for six months, commencing with April. A steady flow of wind from that direction has its origin thousands of miles away, and from the coast of Africa to the continent of South America, is known as the Trade Winds, from the fact that the current is constant in one direction, being along the equator to the west.

That continent running in a north-westerly direction, changes the air current to the north, along the base of the Rocky Mountains that interpose a barrier which it cannot pass. After filling the space between the base of these mountains and the sea coast, this immense and constant volume of air, heated by the glowing sun of the tropics, is forced north, over the low sandy peninsula of Yucatan, into the Gulf of Mexico, where its fan is sufficient to propel the waters of that inland sea northward, forming the current of sea water known as the Gulf Stream. A portion of this heated air passes along the direction of this stream, and gives to Western Europe its mild climate. At one time in the history of the country this air current must have come close inshore, along the coast of Labrador, and making Iceland what ancient mariners called it, Vineland, having a climate more soft and genial than that of the Iceland of to-day. Another portion of this great volume of heated air is forced up the valley of the Mississippi, and its warm breath is felt far into the region of the Hudson's Bay country. As it passes north it fills the whole country drained by the Mississippi and its tributaries, embracing all that part of the country lying between the Rocky Mountains on the west and the Alleghanies on the east, and as the valley widens as we proceed north, it becomes spread out fan-shaped and weakened in its force at its sides, precisely similar to a stream, the centre of which remains strong and passes on while the shores begin to lag, and in some places show eddies running in contrary directions. Along the centre of this air current, on its way north, the prevailing wind is south; but this belt or central current is narrow, and is often driven from its course by contending currents from other points.

But you ask, what has all this to do with shelter belts? Much, very much, as we propose to show. Had this current of heated air nothing to contend against, it would be nearly south in all parts of the valley, and during the summer months uncomfortably warm. Early in spring, say to the first of June, this south-west wind is cold and damp, and when it sweeps over the surface lessens the solar heat, and thus seriously retards the growth of vegetation. This dampness is imparted to it in part by the ocean, but the greater portion is due from the melting snow of the Rocky Mountain range, which is gathered up and accumulated for thousands of miles along the plains at their base, and following down the valleys of

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the streams, meets and mingles with the "Trades," and passing the current to the east, gives us a south-west wind, divested of its warmth, but adding to its force. But while the "Trade Winds" are constant in their flow, the winds from the north and west are not so; hence the changes that occur from the genial days when we have the "Trade Winds" coming direct from the south, at once cut short by an avalanche of the accumulations of damp and cold from the snowy range. Hence the need of shelter belts to ward off the effects of sudden changes to cold and damp that at such times rush in from the south-west and admonish us to protect our ground from approaches of cold from that quarter.

Late in autumn the "Trade Winds" lose their force, and the north-west wind comes to us with its chilling frost, but fortunately in a dry condition, for at that season we have no melting snow to charge the air with dampness; and the result is the air is clear, though cold. Under these conditions, we seldom have drizzling rain, or even snow, while in the spring we have profuse floods of rain from the north-west. The east wind is never cold, from the fact that it is from the ocean; while from the south it is warm, having been heated at the tropics; and it is so seldom that we have a direct north wind that it is not worth our while to take it in the account in considering the benefit of shelter belts. Thus we see that if we make shelter belts to protect our fields from the cold of spring and early summer, we must plant them on the south-west approaches; if for autumn and winter, on the north-west. In dividing the State into sections, it would have been much better had the surveyors run the range lines north-east instead of, as now, to the north. A farm thus laid out would have presented a square front to the two prevailing winds—that of the south-west, which occurs during at least three-fourths of the year, and the chilling, biting blasts of winter, from the north-west. In this case, belts would be required only on two sides of the farm, but as the sections are laid out we must plant on the south, the west, and the north, leaving the farm open to the east.

There are doubtless exceptions to the foregoing rules; but none of them do we believe applicable to that part of the valley lying between the Mississippi and a line running from the south bend of Lake Michigan eastward. To the west of the great river our proposed system would need some modification. The exceptions to the rule may, to some extent, be found within a short distance of the east bank of the Mississippi, which, by its evaporations, modifies the winds, charging them with vapor, and thus giving them an equilibrium, approximating the temperature of the stream; hence on the east bank of such streams shelter is of little or no value to the growing crop, and only useful against the cold of winter. The same may be said of large bodies of water like Lake Michigan, where shelter belts could be of but little advantage, for the lake so modifies the air in winter, in giving off its latent heat, that no great damage from severe cold need be entertained. The belts

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would rob the air of moisture, which is the chief protection, and thus instead of being an advantage, might prove the reverse, by lowering the temperature so as to produce frost. We all know that large bodies of water ward off early frost, by the air becoming charged with vapor; and this influence is continued inland for some distance, but always in the direction of the wind at the time, and never beyond, where the air has, by forests or other obstruction, been robbed of its watery particles.

The space lying between the junction of rivers, like that of the Mississippi and Illinois, and of the former with the Ohio, are notable examples. But on the great stretches of prairie no such condition occurs, and seldom on the west banks of the rivers and lakes mentioned.

While the whole southern country lying between the prairies and the Gulf of Mexico was one unbroken forest, the "Trade Winds" were retarded in their flow, and the autumns were less liable to early frosts than now, when the surface of so many thousands of square miles are laid open to the sun, and thus rapidly robbed of their moisture. In this way the climate has become more and more continental, and losing nearly all of its maratime character imparted to it by the moisture from the Gulf and the retentive nature of the dense forest intervening.

Having disposed of the necessity and value of shelter belts, and of their proper location on the farm, our next inquiry is as to the amount required. This can only be demonstrated by actual experiment; but at present we will run the risk of having too much, for there will be this advantage—it will at any time be worth more than the cost of removal for fuel and other economical purposes.

A Combination of Uses.—That we can combine the wood lot, fence and shelter, there can be no doubt. When we speak of fencing, we do not intend to convey the idea of hedging, in the usual acceptation of the term; for hedging means a low trimmed, live fence, so densely grown that no farm animal can pass through or over it. Such a fence affords little shelter and no fuel. On the other hand, a tree that will combine in itself the elements of a fence, of shelter, and of fuel, is certainly to be preferred. In the White Willow (*Salix alba* of Gray) we find these all combined in a most happy manner. Our ideas have been so long educated with a live fence of but a few feet in hight, that it is with no small effort that we grasp the fact that a forest tree of large proportions, towering eighty feet high, with its long taper branches and wealth of summer foliage, should be placed in the fence row, to divide the fields, and hold the live stock of the farm in their respective places; yet such is the fact, though but an enlargement of the old couplet—

"In summer, shade;
In winter, fire."

Were I a poet, I might be induced to add this new duty, thus showing the combination more complete, and to identify the new use to which the denizens of the forest are now being placed.

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The sylvan belt that stands upon the plain—
In spring robed with gaudy catkin, to entice the bees,
Making in summer shade from solar heat;
And when old Boreas from his northern throne
Comes whistling down with cold intense,
Gives us the winter fire—
Now has new duties, another task;
To guard the fields, and stand as sentinel
Along the meadow's margin,
To see that none intrude,
Whether the bison come back
To claim his ancient pasture,
Or the more modest herd
That now usurp his place.

But I need not enlarge on this point, as you have already ably discussed the subject, and given it an impetus that it may not stop until the prairies shall be made beautiful with waving belts, combining all the uses of a fence, of shelter from high winds, from cold storms, and at the same time furnish you with a cheap and valuable fuel, ready at your hands.

I might go on to show how these belts will modify the climate by giving us the summer shower, condensing the ammonia in the atmosphere, and sending it down to the roots of the growing plants; the absorption of deleterious gasses that fill the air and poison our homes; the withholding of the trade-winds in autumn, thus giving us back the old Indian summer; the more equal distribution of moisture, changing our continental climate to one more maratime; modifying the rigors of winter; in short, giving to the prairies God's last, great gift to man, something of their ancient splendor, when the Garden of Eden stood in its midst, the richest gem in the coronet of the antediluvian world, the wreck of which He plunged beneath the heaving sea, whose waves soon covered the loved and lost of Adam with the silt of a thousand rivers, but now given back to us to be made beautiful by art. Shall we not be true to the trust reposed in us, and make these vast plains what they were intended for, THE GARDEN OF THE WORLD?

ESSAY ON EVERGREENS.

By Samuel Edwards.

Whilst I thank you heartily for the compliment conferred in selecting me to write an essay on Evergreens, to be read at this meeting, I can but regret, as you will, that the choice had not been made of one having more leisure and ability for accomplishing the task.

The subject, in all its bearings, is one in which, I believe, we are unanimously agreed, as being one of the most important coming before us for deliberation; and whilst, with becoming diffidence, the results of my experience are briefly set forth, I can but hope that the discussions which will follow from the fathers of Western

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Horticulture, will tend to the advancement of this branch of our lovely—may we not almost say, sacred art.

What strikes the eye of a stranger more unpleasantly in winter, when viewing for the first time our prairies, than their bleak and desolate, desert-like appearance? What can work so perfect and desirable a change in this respect, and thus effectually remove the embargo placed upon the "dear ones at home" by the chilling blasts of winter, as the liberal planting of Evergreens?

The raising of Evergreens from seed, and successfully transplanting them, have heretofore been, by most people, and are still by many, deemed very difficult and uncertain operations.

In most of the early experiments in growing Evergreens from seed, in this State, which came under my observation, the seed was planted in the open ground, with no more care than we bestow upon fruit or other deciduous tree seeds. Unless the weather continues for several successive weeks wet and cloudy, I have never known this mode of planting to succeed.

Evergreens from the forests of Wisconsin and Michigan were, at an early day, brought in large quantities to our State by the self-sacrificing race of tree peddlers, (unfortunately for our people, not yet extinct,) who took great pains, when arrived in the land of their victims, to keep the roots of their trees wet; selling good specimens at from one-fourth to one-half the lowest prices at which our nurserymen could afford to sell these living trees—and live themselves.

For the time being, our established nurserymen were shunned by many wishing to purchase, not only evergreens, but all nursery products, on account of the supposed extortionate prices charged by them for trees imported from the Eastern States or Europe, above the rates asked by the enterprising peripatetic philanthropists from Wisconsin and Michigan.

Unfortunately for the prolongation of the labors of love, so zealously entered upon by our northern missionaries, except in very few isolated cases, their truly beautiful trees (with which their customers had fondly hoped to beautify and shelter their bleak prairie homes) died, and with them the occupation of the peddler and the hopes of the planter. Our Kennicotts, Bryants, Overmans, Douglas and Phœnix, with their beautiful trees, "still live," and are beginning to be appreciated.

Evergreens on the prairies were pronounced, as some would now call the White Willow, a humbug; our people very generally accepting the idea that they would not grow here, as they had given them a *fair trial*, and that they were not indigenous to the country. In many parts of our prairie region, about half of the native plants, except the grasses, are matured by resinous sap, similar to that of Evergreens, and the latter have been by experience found to thrive as well here as the former. The White Pine has, in some instances, made a growth of nearly or quite four feet in a season, in my grounds.

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The man of capital need ask for no better investment than can be made by planting in the middle of a large prairie, the white and other rapid growing Pines, Red Cedar and Norway Spruce for timber. Had I the means requisite, at least one-quarter section would be planted as a memento of my estimation of their value.

The fine fibrous roots of evergreens brought from regions of country infested with Canada thistles, are frequently the vehicles for introducing that much dreaded pest. I have twice imported them in this manner, and their eradication has cost me much anxiety and labor.

Evergreens can be readily grown in a small way, by planting the latter part of April, near the surface, barely covering the smaller varieties, the largest ones not over half an inch, in boxes six inches deep, nearly filled with sandy soil, placed on the north side of a hedge, or other effectual screen from the direct rays of the sun. A slight covering of moss, to retain moisture until the seeds are sprouted, is beneficial; care must be taken to remove it before the young plants prick through the moss, as they are very easily broken.

If the weather is not moist and cloudy, they should be watered slightly each evening. The greatest difficulty to be guarded against is what the gardeners term "damping off"—the rotting or scalding off of the stem of the young plant at the surface of the ground.

This can be obviated by sowing over the young plants a sprinkling of dry sand as soon as any are seen affected in the manner described.

Robert Douglas, of Waukegan, was, I believe, the first Western nurseryman who made use of this method, which, after two years' trial, I can pronounce a perfect success. The boxes can be removed to a cellar for protection the first winter.

When it is desirable to grow them in large quantities, beds four feet wide, shaded by screens made with lath nailed one-third of an inch apart to cross-pieces, which can be laid off at sunset and replaced at sunrise, is as good a plan as I am conversant with—the invention too, I believe, of Mr. Douglas. This plan is also applicable to small plants from forests, or importations from foreign nurseries. They have also succeeded well, when planted on the north and north-east sides of large evergreens. It has been my practice to protect two-year plants through the winter, by placing pine leaves to the depth of one to two inches among them. At two years, transplant to nursery rows, two to two and a half feet apart, rows running north and south, six to eight inches apart in the row. After remaining two years, alternate plants, and the following, or the fourth year in nursery, alternate rows, should be removed. Evergreens in nursery should be transplanted or thoroughly root-pruned as often as once in two years, until planted in their final location. By observing this course, I have within the

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last two years transplanted over two hundred specimens, ten to seventeen feet in hight; very few, (not five per cent.) have failed to grow. Great care must be taken to prevent the roots from drying in the least whilst out of the ground, as the sap soon hardens, and is then impervious to moisture. Grouting the roots in a mortar, made by mixing clay with water to a proper consistency for adhering, should always be practiced when trees are to be packed for transportation, or when transplanting is done late in the season. In packing for shipment, aim to keep the tops dry and roots moist.

Mulching thoroughly to a foot or more beyond the ends of the roots, as soon as planted, is certain protection against drouth, and except in settled wet weather should never be omitted. If the ground is very dry, water at time of planting, never after mulching. I have known trees killed by too free use of water.

The nurseryman who wishes to have well grown specimens, which always command paying prices from good judges of a beautifully formed tree, must see to it that his trees are never crowded—branches should not interlock, or at any rate, trees in this condition should be transplanted at once.

For the production of very broad-based specimens, the leader may be removed, straighten up one of the best limbs in the topmost whorl, supporting it by a stick made fast to the body of the tree; shorten the remaining upper branches, and any others, except the designed leader, which may tend to assume a too rampant growth.

"Plant thick and thin quick," was the motto of one of the most distinguished English planters of the last century, a rule which has lost nothing by age.

The ground designed for an evergreen nursery, or for their permanent location, should be deeply pulverized, and where a better mode of draining is not practicable, it is advisable in plowing to throw the land in ridges, say, thirty feet in width. The after culture should be shallow, except at sufficient distance from the body of the tree to not disturb the roots. Their vigor of growth is frequently retarded by deep culture too near the tree. In producing a rapid growth, it has been found advantageous to dig deeply each spring, just outside the termination of the roots. A top dressing each winter or spring, of wood soil and leached ashes, well repays its cost in increased growth.

Mulching thoroughly early in June each season, until well established, will answer all the ends attained by good cultivation; many men of experience deem it preferable. Never use rank animal manure for this purpose.

At any time from opening of the ground in spring to bursting of the buds is generally the best time for transplanting most varieties. If the buds are started much, great care is requisite in handling them, to guard against breaking them off, and thus destroy the future symmetry of the tree. Arbor Vitæs, Junipers and Hemlocks, I prefer to set early.

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If the weather is cloudy and moist, evergreens can be safely transplanted in June and July. The last half of August and the first half of September is a good time; if set after the tenth of the latter month, thorough mulching is indispensable to protect the tender young rootlets from injury by sudden freezing and thawing the following winter.

The different varieties of Juniper seem especially adapted to high, dry localities; Arbor Vitæs, American Spruces, to low moist ones; while the hardy Pines, Firs and Norway Spruce succeed, I may almost say, equally well in dry or rather wet soil.

Since the last report of a committee of your Society, on hardiness of varieties, I have proved to be hardy, a new variety of Spruce from Pike's Peak, Piceas Normanniana and Pichta, Pinus Pumilis, and the beautiful profuse flowering shrub, Andromeda Florabundi; and as tender, Cryptomera Nana, Retinospora Ericoides, Pinus Benthamiana and Sabiniana.

In considering the value of evergreens for ornament, screens for our homes, gardens, orchards, birds, stock-yards and for timber, much could be profitably written; but as these particulars come under the heads assigned to other and abler members of your Society, as topics for essays to be read before this meeting, I will only say that I consider them much more valuable for all of the above purposes than deciduous trees.

With the hope that Evergreens will at no distant day be properly appreciated and profusely planted all over our at present bleak prairies, cheering our dreary winters by their beauty and shelter, raising heavenward their elegant spires, guiding alike the eye and soul of man to the Great Designer and Creator of all beauty and protection—let the pioneers in evergreen culture on the prairies, toil on, fulfilling their high destiny, with full confidence that "they shall have their reward."

"THE EVERGREENS," La Moille, Illinois, *December*, 1862.

CULTIVATION OF FOREST TREES.

By G. W. MINIER, of Tazewell county.

It is proposed in this paper, to show, practically, how some good may be accomplished by planting and cultivating forest trees on our farms and by our homes, and as this Society delights to give that information which shall be most essential to the well being of our population, it is proposed to recommend but few varieties, and those of known utility.

At the head of this list allow me to place the Silver-leafed Maple. (*Acer eriocorpum.*) "This is our great Western maple, a rapid grower—a splendid tree, whether in the yard, the grove, or by the glassy stream," easily grown into groves to beautify, adorn and warm our homes.

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Having never yet seen a good account of the management from the seed to the full-grown tree, it will not be out of place, perhaps, to give my own.

The usual time for gathering seed is about the 20th of May, but differs in different seasons. Whoever has an old crab tree in sight, may take that for his guide. When the crab apple is in full bloom, and the blossoms begin to drop, then is your time; a neglect of two days may be fatal. For, go after the seed has fallen from the trees, and you might suppose that Drs. Walsh and Thomas had called a convention of insects, bugs and beetles, and that they had all come, and that Holder had also added a bevy of birds, and Kennicott a squad or two of squirrels, and there they were, preying upon your maple seeds. They are thus devoured in double quick time.

It is doubtless best to gather the seeds before falling, and plant immediately—the same day if possible. Let your soil be as wet as can be easily wrought, as the tree delights in a moist situation. If your seeds is gathered immaturely, they do but poorly. If you tarry too long, they are devoured and lost. This is the point where success and failure meet. Plant shallow—one inch in depth—and they will grow as certain as corn. Cultivate carefully one or two years, and thin out to your fancy. Five acres of these trees, which will cost no more than so much corn, will soon yield all the fuel the farmer needs, and supply some fencing at least.

The Black and White Walnut are easily grown from the nuts, and should be found on every farm in Illinois. Cover the nuts in the fall and plant in the spring, in rows four or even eight feet asunder, which will soon give you a dense grove of nut trees, giving both fruit and timber.

The Oaks may be raised by patient men, but do not so soon repay as those above mentioned. As a general rule, trees indigenous to Illinois do well on our prairies, when properly cultivated. Exotics may be supposed of doubtful expediency. I cannot, therefore, recommend the Black Locust; on the contrary, I have condemned it for twenty years, and the sad experience of my fellow-agriculturists now fully sustains my views.

It is dangerous, if not absolutely heterodox, to speak, or even to think, disparagingly of the Willow, especially of that splendid exotic (I am alluding to Illinois only,) the "White Willow." Still, my friends, in view of some mistakes heretofore made, let us hasten leisurely among the willows. Nature has given abundance of material for groves in our own State, and nature never errs. Use her treasures, if you will, with an unsparing hand and a grateful heart, but take a little heed how you attempt to coerce her into your notions of beauty and utility.

FLOWERDALE FARM, *September*, 1862.

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KITCHEN AND MARKET GARDENING.

By Jno. Perlam, of Cook County.

Among savage nations the culture of the earth is but little practiced. Maize, beans, the seeds of grasses, and a few other indigenous plants, constitute their whole agriculture, if, indeed, that may be so called which consists in planting, reaping and storing away.

As man emerges from barbarism, his attention is turned to the raising of flocks and herds, thence to the cultivation of the earth, as a means of subsistence; but not until a high state of enlightenment has been reached can horticulture be practiced.

It is more than probable that a higher state of systematic science has been attained within the last hundred years than had been before known since the foundation of the world. It is said that Egypt, "the cradle of civilization," had so far perfected her tillage that the banks of the Nile were adorned with plantations, from the Cataract of Syrene to the shores of the Delta, but it was not until Thebes, with its hundred gates, and the cities of Memphis and Heliopolis were rising in grandeur, and not until the stupendous pyramids, obelisks and temples of Egypt had become the wonder of the world. Solomon had not delighted to dwell in gardens, nor planted the "vineyard of Baalhamon," until after the queen of Sheba had heard of his power and glory. The hanging gardens of Semiramis were more works of art than scientific culture, and the villas of Rome and Greece were more noted for their statuary and paintings than for the extraordinary culture of their gardens. With the dark ages came the destruction of the arts and sciences, and with it what horticultural knowledge had heretofore been taught. As returning civilization began to be spread over Western Europe, gardens were again cultivated. And yet, so gradual was the progress of horticulture, that, until the reign of Henry VIII, scarcely any kitchen vegetables were cultivated in England. Not until Evelyn "first taught gardening to speak English," had much scientific knowledge been practiced. Since that time, with the increased facilities for knowledge, by means of cheap printing, it has made rapid strides towards that perfect science which it must ultimately reach, checked only by insane rebellions and the grasping after tyrannical power by soulless politicians.

Kitchen gardening will not receive the attention which it deserves from the farmer until scientific agriculture has been widely disseminated. And yet a single half acre, well attended, will produce, from year to year, half the sustenance of a large family. Horticulturists, as a class, are intelligent, thinking people. Why? Because the products of the garden are better sustainers of the brain than "hog and hominy." Show me a country without orchards and gardens, and you will there find a stolid and imbruted race. But where the trees drop ripe fruits, and well-tilled gardens are swelling with vegetable wealth, and casting the sweet perfume

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of flowers over all, there is an intelligent, thinking, onward-moving people, whose motto is Excelsior.

The three grand requisites for successful gardening are, a thoroughly drained soil, (naturally or otherwise,) plenty of manure, and the best of cultivation. With these, no man can fail of success. In market gardening, there need be no regular succession as is practiced in farming—no fallows; the soil must be made to produce a succession each year. The land must groan with its burden from early spring until the snows cover the landscape. Thus, tomatoes, cucumbers and late corn may succeed spinach; late melons follow a crop of early turnips, beets or carrots; cabbage and swedes after early potatoes; squashes planted with the earlier varieties of corn, will grow and produce bountiful crops after it has been cut and stacked. Many varieties of vegetables may follow early peas, besides the almost endless variety with which every gardener is acquainted. Among farmers it is otten the case, that when they undertake to raise vegetables it is done in their fields with their other crops. This is all wrong, with the exception, perhaps, of late potatoes and turnips. There is nothing that pays better, either to the person or pocket, than a well kept garden; nothing more healthful to the mind than a walk therein with the wife and little ones, after the toils of the day. It will soon become a labor of love to the little ones to help care for and weed it; soon will come the heavenly influence of flowers.

Let one or two individuals in each neighborhood set the example, and it will not be long before others will follow, and soon gardens will be planted by all. Why then will not all decide to do something more for the next year than they have already done for the last, that our homes may be made more smiling and happy from season to season? It is neither a small business, nor unprofitable. Do you lack knowledge? learn from books and the press, the depositories of all knowledge.

Adam, driven from Paradise, found the earth barren and unfruitful. The children of Adam are redeeming it. Where once the painted savage lived on rapine and slaughter, the cabins of the peaceful pioneer have been built. Begirt with well-tilled fields, they have become prosperous farms, and comfortable dwellings are occupied by happy faces. Add but the well kept kitchen garden, and it will not be long before flowers will blossom and stately trees grow up. Each home will become a garden, and this country, for which God has done so much and man so little, will be the paradise and glory of the world.

In choosing a garden spot, select a southern or eastern exposure if possible. The eastern or northern side of a stream is preferable. The best soil is a deep sandy loam; a heavy clay, the worst of all. If water even stands within three feet of the surface, it should be underdrained, either brush, stone or tile; the latter is best, and cheapest in the end. If to be connected with a home orchard and

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small fruit garden, it should contain at least two acres. The apples, pears, cherries, plums, quinces, raspberries, blackberries, currants, gooseberries, etc., should be on the west, commencing in the order named. If dwarf pears are used, they should be placed between plums and quinces. The whole garden should be inclosed with a red or white cedar hedge, as a protection from winds and cold. A parallelogram is the proper shape, the longest way from north to south. There should be a gate in the centre of the vegetable garden for the carting in of manure and the carting out of crops and trash. The road way should be ten feet wide, and at the opposite extremity should be a circular turn, about four rods in diameter, entering the same road again. The circular bed may be used for flowers, if liked, or for strawberries, asparagus, rhubarb, or any other perennial plant that does not require to be much disturbed by the plow. By this arrangement the crops may be planted clear across the plat, and the most of the work done with a horse. If wanted more ornamental, and the labor is to be done by hand, other forms may be used, and much taste be displayed in the arrangement and ornamenting. If the entrance to the garden is from the south, the spaces on each side of the circle may be occupied with hot-beds; at all events these should be upon the north line, where they may be well protected from winds. If one acre of this inclosure has been devoted to fruits, we shall have for vegetables a strip, say, about six and a half rods wide by twenty-six rods long, divided through the centre by the roadway, leaving a land upon each side somewhat over three rods wide. Upon the west side of the road next to the small fruits, at a distance of four feet, a double row of asparagus may be planted one foot apart, thus ∴∴∴∴∴ extending half way across; the row to be finished out with a single line of rhubarb two feet apart. Next should come medicinal and culinary herbs, (perennial,) using so much of each row as may be needed. Thus, one row may be used for Pennyroyal, (*Mentha pulegium*); Peppermint, (*M. labitata*); and Spearmint, (*M. viridis.*) The next row may contain Sage, (*Salvia officinalis*); Dill, (*Anethum graveolens*); and Marjoram, (*Origanum heracleoticum*); and so on, for as many varieties as may be desired. These rows may be two and half feet apart, the plants from one foot to eighteen inches apart. A double row of strawberries may be planted next,

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mit of horse cultivation, and being planted quite close in the rows. By placing radish, spinach, lettuce, early beets, turnips, carrots, together, a land may be secured in which may be planted, about the first of June, water and musk melons, which will generally produce a fine crop of late fruit. The only rotation to be practiced is to succeed fibrous-rooted plants as much as possible, with tap-rooted ones, and plants which mature under ground with those which bear their fruit above ground. As for the rest, it must be done with manures, ashes, lime, broken bones, soot, feathers, and the wash of the house, composted together. How much of each particular kind of vegetable may be needed I do not pretend to say. If too little is planted this year, more may be raised next, and if too much is raised, it may always be disposed of to shiftless or indolent neighbors.

To those who wish to lay out a garden to be cultivated altogether by hand, the parallelogram should be still adhered to, except that the wagon road should proceed only to, and turn back at the centre, making the circle there. A path, four feet wide, should be laid out all around the plat, leaving an outside border about twelve feet wide. From the centre, paths, four feet wide, should diverge, dividing the balance of the plat into four equal parts. The borders may be used for dwarf fruit trees. Grapes may be trained to the fences, and the south side of the walks may be used for currants, gooseberries, quinces, etc. The centre may have a summer-house, with flower-beds about it. These may be varied to suit different tastes, as where hand labor alone is used, angular and serpentine lines are not so much in the way of cultivation.

With these remarks, I shall proceed to notice some of the more desirable plants for cultivation.

Asparagus.—The soil should be deeply trenched. If for horse culture, the rows may be two and a half feet apart, the plants one foot apart in the row; open the trenches eight inches deep; set the plants so that the crowns shall be five inches below the surface. When the land is trenched, it should have from four to six inches of rotten manure incorporated with the soil. If the soil has been properly prepared, a little may be cut the second year, and at four years old a full crop, extending to the 15th or 20th of June. Select two year old plants to set. There are two kinds, the green and purple top. It is manure, and good cultivation that make mammoth varieties. The plantation may be made in March or April. It may be raised from seed, or the two year old plants bought of some reliable nurseryman. In November, after the stalks are thoroughly dead, cut and remove them, and cover the plants or bed with about two inches of rotten manure, over which place straw or litter, which is to be raked off in the spring, when the bed is to be lightly dug with a fork, taking care not to injure the crowns or roots. A little salt sown on the bed each year is

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beneficial. No after cultivation is needed except to keep down weeds, except the annual digging and manuring.

Beans.—The varieties for garden cultivation are dwarf and pole beans. The earlier varieties of dwarf beans are Early Rachel, Early Mohawk, China Red Eye, Rob Roy, Refugee and Turtle Soup. The first is probably the earliest, and the last is growing into favor, on account of the tenderness and excellence of its pods, and the length of time which they continue fit for use. Beans should be planted as soon in the spring as danger of the frost is over, to be immediately replanted if cut down. Plant in drills two and a half feet apart by about two inches; cover one and a half inches deep; when two or three inches high, cultivate, and continue from time to time until in flower. A little earth should be drawn to the stems. For a succession of crops, they should be planted at intervals of two or three weeks. They should not be worked while the dew is on them.

Pole Beans.—Amogst these the Limas deservedly rank the highest. The green variety is the largest and best, but the smaller white variety is the most prolific and sure. They are extremely sensitive to cold, and should not be planted in Northern Illinois before the first of June. The hills should be laid out three and a half feet apart, and a good shovelful of well-rotted manure incorporated with the soil. The hills should be broad, raised about five or six inches above the general level. The poles should be set in the center of the hills, so as to range both ways if more than one row is needed. Plant six or eight beans in each hill, thinning out to three after they become well established. It is well to stick hazel brush leaning towards the poles to facilitate the vines obtaining a firm hold, and some tying may also be necessary. The poles need not be more than six and a half feet high from the ground, and they should be inserted fourteen to sixteen inches; cut the vines off when they reach the tops of the poles, to induce fruitfulness; keep the ground clean. There are other varieties of pole beans, as the Scartlet Runner, Case Knife, etc., that are valuable for string beans. If considered desirable to force beans, they may be planted in cold frames about the first of May, and transplanted at the proper season.

Cucumber.—This family of plants has probably excited more attention from man in all ages than almost any other. The Israelites mourned its loss while wandering in the wilderness; princes have spent large sums to procure it at all seasons; poets have sung its praises, while some physicians have foolishly declared it little better than poison. It is particularly sensitive to frost, is attacked by a number of insects, requires a great deal of care, but amply repays the labor bestowed upon it. It requires a deep, rich soil, and well repays sheltering by hand glasses and other appli-

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ances. The hills may be five feet apart, well enriched with well rotted manure. Plant about the middle of April under hand lights (square boxes containing an 8x10 glass), to be replaced by four light boxes as they progress. When they have run about eight or ten inches, pinch out the terminal bud to induce them to throw out fruit vines; keep the ground mellow and free from weeds, pinching the vines from time to time to keep them regular and in good shape; by these means fruit may be obtained two or three weeks earlier than by the common method of planting them in the open air and letting them take care of themselves. The same practice will apply to the whole family, except that summer squashes need no pinching, and should be planted four and a half feet apart; musk melons, six feet; water melons, eight to ten feet; and winter squash, ten to 12 feet apart. The most desirable varieties of cucumber are the Long Early Frame, White Spine, and Negley, for forcing, and Long Prickly, and Short Prickly for pickling.

Summer Squash.—Summer Crook Neck and White Scallop.

Water Melon.—Black Spanish and Imperial Spanish.

Winter Squash.—Boston Marrow and Hubbard; the last desirable as a long keeping squash.

Corn.—The most desirable varieties are, Extra Early Pearl, Extra Early Dwarf Sweet, Darling's, Burr's New Sugar, and Stowel's Evergreen. These varieties, planted at one time, will give a succession. Stowel's may be again planted the first of June, and again the middle of June, which last planting will generally be ready to cut up before frost, and put in shock, and will continue to give green corn for two or three weeks after. My practice is to make a final planting about the first of July, so that if the frost holds off late, I am assured of plenty of corn until cold weather. The first two varieties named should be planted three feet apart, about nine inches for the first sort, and ten to twelve for the second and third sorts, in drills of course. The later sorts may be three and a half feet apart, by twelve inches in the drill.

Cabbage—Requires a deep, rich, tolerably compact soil. For early, plant in hot-beds about March first, giving plenty of air in pleasant weather. As soon as they are three inches high they may be transplanted into other beds, three inches apart, where they will get to be stocky plants, and may be set in the open ground in a warm border from the middle of April to May first. Lettuce, cauliflower, and kohl rabi, may be raised in the same compartment of the hot-bed, and treated alike, they all requiring but little heat. Early York and Winningstadt are the best cabbage for forcing. Rows for cabbage should be two feet apart by one foot for York, and one and a half feet for Winningstadt, in the row.

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LETTUCE, six inches in row, taking out alternate plants as they crowd. Probably the Early Cabbage is the best variety, though the Green Curled Silesia is good.

CAULIFLOWER needs the same distance as cabbage. It should be watched at the time of blossoming, and the leaves either tied up or broken over the flower to blanch it.

KOHL RABI should be planted one foot in the row. It has a bulbous swelling between the top and root, which is the edible part; and in taste is between a cabbage and turnip.

CARROTS should be sown, for early, as soon as the ground can be worked. French Short Scarlet, or Horn, is best. The plants should stand two inches apart.

BEETS, TURNIPS, SPINACH, ETC., may be sown contiguous, having cabbage, lettuce, etc., adjoining; and if melons or cucumbers are planted among them at the proper time they will produce abundant late crops after the others have been taken off. Early Flat Dutch is a good turnip, and Early Bassano the best early. *Beet*, for late use, Long and Turnip Blood; and for late turnip, use White, or Purple Top Strap Leaf.

EGG PLANT.—This beautiful fruit must eventually come into general use. True, it requires an educated taste, but remember, the tomato was once (and still is by many) considered a disgusting article of food. Egg plant, tomato, and pepper, should be sown in the hot-bed about the first week in March. They require a strong heat. As soon as three inches high, transplant into other beds, six inches apart; give plenty of air in fine weather. The temperature of the bed should never fall below 50 degs., nor be above 80 degs. If the season be cold, transplant about the first of May into frames with a gentle heat, one foot apart, where they may remain until the first of June, when they may be removed into the open air. If they are designed to occupy a single row across the plat, the row may be three feet wide.

TOMATOES should be planted four feet asunder in the row, and trained to a trellis; the egg plant, twenty inches apart; and the peppers, fifteen inches. If the row is not all occupied, it may be filled out with okra, which should be planted about the time the former are set, from 20th May to 1st of June; sow two inches apart, in drill, and when well established, thin out to ten or twelve inches asunder; cultivate as for beans. The young pods, while tender, are to be used as string beans, or cut thin and stewed with tomatoes, or made into gumbo, of which people become extravagantly fond. To make gumbo, take one peck of young pods of okra, sliced thin; one full-grown, fat fowl, cut in pieces, the gizzard, heart, and liver chopped small; one pound and a half of lean beef; a handful of ham cut into small squares. Stew in a close

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vessel for four or five hours, or longer if not tender; if necessary to add water during cooking, let it be boiling hot; when done, it should be a thick, mucilaginous substance; the whole should be properly seasoned according to taste; add parsley, basil, and other herbs, as for soup. Before it is done, prepare rice, by boiling so that each grain shall preserve its shape, and not become a gluey mass, as is often the case. Serve the rice up on deep plates, with plenty of the gumbo ladled upon it. I have never known a person to refuse it after having eaten it once.

Rhubarb.—Myat's Victoria and Linnæus are as good as any. The plants should be three and one-half feet apart by two and one-half feet. The "Old Doctor's" plan of cultivation is the best of any, manure! manure!! manure!!! It should be covered in winter the same as asparagus.

Nasturtium.—Ornamental as well as useful. An excellent climber, and good for covering screens. It is covered in August with brilliant crimson and orange-colored flowers. It should be sown in rows four feet apart by three or four inches in the row; if for fruit, the soil should not be too rich. The plants should be supported by strong brush, unless planted by a fence or trellis. The fruit is used for pickling, either alone or with cucumbers, to which they impart pungency. The leaves and flowers are used in salads; also, as a garnish. They are also said to be good for weakness or pain in the stomach.

Chickory is attracting attention as a substitute for coffee, although it has been used from time immemorial at hotels, for ought I know, for that purpose. The root is the part used for culinary purposes. It should be planted about the middle of May, upon slight ridges, two and one-half feet apart; the plants thinned to ten inches. It requires a rich, moist, sandy soil. The crop may be dug in October, washed, dried, cut into pieces, and cured dry by fire heat, then roasted and ground as coffee.

Hop.—Every garden should have a few poles of this useful plant. It is an herbaceous, climbing perennial. Each hill requires six feet. They require a rich, deep, sandy soil, with a dry substratum. If not naturally so, it should be enriched with plenty of well-rotted manure, deeply worked in. Cedar poles fourteen to sixteen feet long should be used, allowing three plants to each hill. The first year they will only require a stout stake. In the autumn some litter should be thrown over the stools to protect them from frost. The spring following, the suckers and shoots may be cut off pretty close to the main roots. The trimmings may be prepared for the table like asparagus. The first year, the roots may be covered about six inches deep; the second season, the hills are to be raised so that the roots may be covered to the depth of ten or eleven inches. Allow two poles to each hill; select only the strongest

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vines for bearing, and bury the weaker ones in the hill; cultivate thoroughly. The last of August to the first of September the hops will be ready to gather. They should be of a fine straw color, inclining to brown; if left later, they lose many of their good qualities. They should not be gathered while the dew is on. After being thoroughly dried, they may be put away in paper bags for future use.

Peas require a rich, deep soil, not newly enriched, however, with strong manure. Daniel O'Rourke, Prince Albert, Champion of England, and British Queen, will give a succession. For the first two varieties, drills four feet apart will be sufficient; Champion should be allowed five feet, and British Queen, or Marrowfat, six feet. Sow in double rows ten inches apart, and one and one-half to two inches in the rows; this will give three and one-half, four and one-half, and five and one-half feet between double rows, which is not too much where fine peas are required. The length of the brush may correspond to the width between rows, and should be oak or the trimmings of apple trees. For early crops, they may be planted about three inches deep, but for general crops, five inches is better. Sow early in the spring, as early as the ground can be worked.

Horse Radish requires a deep, rich, moist soil, and should be planted in a trench fourteen to sixteen inches deep, about twelve inches asunder. Portions of the root containing two eyes may be used, but the best plants are raised from the crowns. After the trenches are filled and raked smooth, a sowing of radish, lettuce or spinach, may be made which will come off before the plants require the room. The plantation may be made late in the fall or early in the spring. As they require two years to come to perfection, a plantation should be made the succeeding season, and each year thereafter.

Salsify, or Vegetable Oyster, is another plant too little cultivated, and, like the parsnip, may be left in the ground during the winter. When in blossom, the second year, its beautiful blue flowers are really attractive. It may be sown in shallow drills, and thinned out to six inches apart. This rule will also apply to *Parsnips and Carrots;* space enough may be left between the drills to cultivate with horse. Hollow Crown and Guernsey are the best parsnip; and for family use, both early and late, the French short-horn carrot.

I will conclude this perhaps tiresome list with the mode of cultivation of that highly valuable and much neglected esculent, the Sweet Potato. If desired, the potatoes may be planted in hot-beds about the middle of April, and the sprouts transplanted from the 20th of May to the 10th of June; at all events, they should not be set out until all danger of frosts is over, and the nights are warm.

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A light, sandy soil is the best; if poor, use thoroughly decomposed manure in the bottom of the drills. First, plow deeply and harrow thoroughly early in the spring; keep down the weeds until planting time, then plow the land the second time, if needed, following with the harrow. Mark out the drills about six inches deep, and if the land is poor, fill the drills with manure. They should be exact distances apart, three or three and one-half feet, on account of ease in cultivation thereafter. Then, with a winged shovel-plow, form into ridges as high as possible, having the drills filled with manure directly under the ridges. If the land is sufficiently rich, the drills with manure may be omitted. About the 1st of June, set good plants in the crown of the ridge, about sixteen to eighteen inches apart. As the plants are set, leave a little depression into which an assistant will pour about half a pint of water; when the water is soaked away, draw a little dry earth up to the plants. If cut worms destroy any plants, hunt them out and re-set. The after culture consists in keeping free from weeds, and occasionally raising the vines in wet weather, that they may not take root in the side of the ridges, and thereby injure the crop. They should be dug before frost, carefully handled, and stored in boxes in a moderately warm, dry place for future use. They may be kept thus in a suitable room all winter.

The making and managing of hot-beds, being one of the most important operations in gardening, I have reserved it until the last.

Much has been said and more written upon hot-bed structures—expensive affairs laid up in brick and mortar—and yet the old-fashioned kind still continue to give very good satisfaction. A good size for sashes is six feet long, containing four rows of 8x6 glass, to be made of the best two-inch clear pine. If the strips are made suitable for 8x10 glass, they will also fit 8x6; the latter is preferable, because cheaper, and if a light is broken, it does not cost so much to replace as a larger one. These sashes are about three feet four inches wide, and four sashes are convenient for a frame. The frames are made of one and a half inch common pine or hemlock for the back and front, and one inch stuff for the ends. The posts may be 2x4 scantling, one and a half feet long for the back, and one foot for the front. It will require one post for each corner and one for each center, making six in all. The strips for the sash to slide on should be one and a half inches wide and three inches deep, worked so that there may be a projection on each side, of half an inch, for the sash to slide in, leaving half an inch in the

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wanted. This is the cheapest *good* frame that I have ever used, and the sash are the best that can be made. The boards for this frame need not be more than ten inches wide for the front, and one foot for the back, as pieces can be laid in at the back to keep the dirt from falling into the bed. When the soil is dry, I should advise digging a pit for the bed, as deep as the manure is to be laid, say eighteen inches, the dirt that is thrown out to be used in banking up the sides. Those who wish to learn the process of winter forcing must go to the authority of books, as the details would take up more space than could be used in an article of this kind.

The latter part of February, fresh horse manure should be hauled to the place prepared for the beds, and laid up in a conical heap, or if a range of beds are required, into a ridge. As soon as it begins to heat thoroughly it should be turned over and well mixed, the long and the short together, and left for three or four days more, when, if it is still rank, it should be turned again. When properly prepared it will have assumed a uniform brown color. If too dry, it should be watered to make it heat uniformly. When it is placed in the bed it should be thoroughly shaken up and laid regularly, patting it down from time to time with the fork, to avoid soft places and make it lie level. When finished it should be about eighteen to twenty inches thick, and should slope slightly towards the front. The frames should then be placed on, banked up, covered with the sash, and left to heat. As soon as the heat begins to rise, two inches of dirt may be strewed over the bed, and when the thermometer remains stationary in the bed about 85 deg., five inches more of good composted earth may be added, and the next day it may be planted. Mats of straw must be used in cold weather and at night, to cover the glass and prevent the beds from being chilled. After the plants are up, air must be given in pleasant weather, that they may grow strong and healthy; in fact, more damage is done by novices, in keeping the beds too close, than by giving too much air. A safe rule is not to let the thermometer sink below 50 deg., nor rise above 85 deg. A hill of cucumbers may be planted to each sash, as before they shall have attained size enough to interfere with the other plants, they will be ready to prick into other beds, and the cucumbers may be left to occupy the whole frame. The beds for transplanting into may be made as the first, except that so much manure will not be required. The most successful arrangement that I have used for transplanting into is troughs three feet long, made by nailing pieces of siding against sections of fence boards, and laying them in the beds, one against another, until the whole bottom is covered, fill with earth and transplant therein, six inches apart. These are suitable for tomatoes, egg plants, peppers, etc., and can be carried to the field and the plants cut out without breaking the ball of earth. They are also capital for cucumbers, melons, and squashes, which are to be transferred into hand lights, which brings me to speak of this very important part of forcing.

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Single light boxes are made of half inch stuff for back and front, and one inch stuff for the sides, sawed beveling so that they may slant to the sun. A groove is to be cut in the sides, so as to allow an 8x10 glass to slide therein. Others may be made for four lights, by putting a strip in the center, and should be used for all vines as a protection from insects, as well as for forcing. A tank should be placed near the hot-beds, for warming water by means of sash, for the watering of the beds is a most important matter. It should be done generally at noon, with tepid water.

The space that I have occupied warns me that I must close, although the half is not written, but as knowledge lies in books, it is not hidden from those who carefully seek after it.

RIVERSIDE, Hope P. O., Cook county, Ill.

FRUIT LISTS.

The committee appointed have received the following lists:

PEACHES.—T. J. Evans, South Pass, Ill., writes one of the committee: "After consultation with orchardists in this vicinity, and with the aid of my own observation and experience here, I submit the following list of peaches for an orchard of 2000 trees (or more) for market purposes: 100 Hale's Early, ripens July 1st to the 5th, (supposed) not yet tested; 50 Early Tillottson, ripens July 5th to the 10th; 200 Troth's Early, ripens July 10th to 17th; 100 Large Early York, ripens July 15th to the 22nd; 100 Honest John, (white,) ripens July 20th to the 25th; 100 Honest John, (yellow,) ripens July 20th to 25th; 250 Crawford's Early, ripens July 25th to August 1st and 5th; 200 Coolidge's Favorite, ripens August 1st to the 10th; 200 Old Mixon (free), ripens August 10th to the 20th; 200 Crawford's Late, ripens August 15th to the 25th; 100 President, ripens August 25th to the 30th; 100 Lagrange, ripens Sept. 1st; 100 White Heath (free), ripens Sept. 1st to 10th; 200 Smock (free), ripens Sept. 5th to 15th.

"I have tested the above varieties in the Chicago market, as well as in the orchard. Early Tillottson mildews badly, but as there is

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Cole's Early; Troth's Early; Early Tillottson; Crawford's Early; Crawford's Late; Stump the World; Old Mixon, (free); Morris' White; Late White Heath; Bergen's Yellow.

STRAWBERRIES.—The Cremont Perpetual, Hooker's Seedling, and Extra Red, were added to lists previously recommended for amateur culture.

Geo. Barry, of Alton, Ill., recommended the following list as suitable for that region: Wilson's Albany, Longworth's Prolific, McAvoy's Superior, and a variety supposed to be the Hudson—not very large, but *very prolific.*

RASPBERRIES.—The Purple Cane and Doolittle's Black Cap were recommended for general cultivation, and the Wild Black Cap for *more* general cultivation.

Geo. Barry, Alton, recommended for that locality, Belle de Fontenay, (which ought to be mulched on dry ground), and Ohio Ever-bearing.

BLACKBERRIES.—The *Dewberry* was recommended for amateur culture. The *New Rochelle* is recommended by Mr. Barry for the Alton district.

The *Service berry* was recommended for general cultivation.

The *Dwarf Shad berry* was recommended for trial.

PLUMS.—The *Chickasaw Plum* was recommended for trial. G. W. Minier says it is very fine when fully ripe; bears freely, and ripens from August to September.

Mirabella, recommended for trial.

Lombard, recommended for general cultivation.

Huling's Superb, recommended for further trial.

The *German Prune* and *Coe's Golden Drop*, recommended for amateur culture.

GOOSEBERRIES.—F. K. Phœnix—I think Houghton's Seedling and the Pale Red are slightly mixed.

O. B. Galusha—They are perfectly distinct. The Pale Red is the most enormous bearer I ever saw. It has a tough skin, and is very acid. Houghton's Seedling is not so good a bearer, but a better berry.

F. K. Phœnix—It bears South much better than here. A good many sell one for the other, and *vice versa.*

Galusha—The Pale Red has an erect habit; the Houghton is very straggling.

Beeler, of Indianapolis—They are perfectly distinct; the shoots of the Pale Red are longer. The Houghton mildewed with us the past season; the Pale Red did not.

Phœnix—Houghton's is the freest from mildew with me.

Bryant—The past season has been no criterion to judge by.

Downing's Seedling was recommended for general trial.

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CHERRIES.—In the report of the committee on a list of fruit for the Alton District, the Early Richmond Cherry was recommended. M. L. Dunlap moved that the word Kentish be adopted in place of Early Richmond, adopting Downing as the standard in nomenclature.

Members were opposed to it, because the Society, at its last meeting, had adopted the name, Early Richmond, and it is the name by which the cherry is generally known in the West. Mr. Phœnix was opposed to the change, because he believed this cherry should be the type of a family of its own, between Morello and Duke, and that we should try and build up a class of early and late, and call the *class* Kentish. But he would not change the name of this particular one from Early Richmond to Kentish.

A committee, consisting of Dr. J. A. Warder, C. R. Overman, and F. K. Phœnix, was appointed to report on the subject. Two reports are the result—a majority and a minority report.

MAJORITY REPORT.—In consulting our great authority, C. Downing, we find a very brief description of the *Early May*, from which there might be some difficulty in making out the identity of the variety; but we have collateral testimony in the quotations from Thompson & Lindley, and in its European synonyms, that it is of foreign origin, and as it has been long cultivated and widely disseminated through and from Virginia, we may conclude that it has been introduced from England, perhaps very early.

In his description Downing says: "it is not of much value." This sentence will have a very different estimate in a country where the best cherries may be successfully grown, from that which it will possess where planters are less fortunate. Where we cannot grow good cherries, this variety, though acknow'edged to be indifferent, is the best for us.

In his description of the *Kentish* or Early Richmond, Downing also gives its French synonym, *Montmorency a longue queue*, and describes it as having a long stem (or tail), "an inch and a quarter long and rather stout," while the *Early May* has a short stem. Of the color he says: "fine, bright red, becoming somewhat dark when fully ripe." Now, the cherry we call "*Early May*," and which we believe to be that described by Downing under that name, is a fine, light red, or as he says, "lively red," and, indeed, as we know of our cherry, a *pale red* in many cases. The Kentish has a "rather rich, acid flavor," according to our author, which cannot be so correctly affirmed of the Early May, which, it must be confessed, has a rather thin juice. Of the tree Downing says the Early May is "rather dwarfish" in its habits, while to the Kentish he gives the character of a taller tree.

These brief remarks are offered as a report progress. Your committee would prefer that it be not now adopted as the sense of the Society, but that it be put upon record for the consideration of the members, and for their future action, after they may have had an opportunity of examining this subject for themselves and verifying the data we have presented.

JNO. A. WARDER, *Chairman.*
C. R. OVERMAN.

MINORITY REPORT.—That the Majority Report, as briefly considered by the undersigned, seems to contravene the action of this Society at its last winter meeting—therefore the writer is compelled to dissent, and re-affirm his adherence to the views expressed upon

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ORNAMENTAL AND TIMBER TREES.

Recommended by the committee for the Alton district, for general cultivation:

Evergreens: Norway Spruce, White Pine, Austrian Pine, American Arbor Vitæ, Siberian Arbor Vitæ, Red Cedar.

Deciduous Ornamental: Silver Maple, Sugar or Rock Maple, White Elm, Catalpa, European Mountain Ash.

For Timber and Ornament: Silver Maple, Black and White Walnuts, White Willow.

FAIR OF THE ILL. STATE HORTICULTURAL SOCIETY,

HELD IN BRYAN HALL, CHICAGO, SEPT. 8 TO 13, 1862.

The exhibition, in all its departments, except garden vegetables, exceeded the hopes of the most sanguine of the officers or members; reflecting credit, alike upon the Prairie State, as the home of Flora and Pomona, the members of the Society for their enterprise and skill in developing the horticultural resources of the State, and the officers for the taste displayed in the general plan of the exhibition. The Chicago papers gave full reports of the fair, bestowing high encomiums upon the Society. We have room for only one or two quotations.—(*Pub. Com.*)

THE HORTICULTURAL FAIR.—The Annual Fair of the Illinois Horticultural Society, at Bryan Hall, during the past week, has been a complete success, so far as the display of fruits, flowers and plants is concerned; but the attendance has not been as large as this splendid exhibition deserved. No exhibition of fruit west of the mountains (if anywhere on this continent) has equalled this; and the display of plants, shrubs and flowers is also very extensive in variety, and many of the varieties exceeding rare and beautiful.

The view from the gallery into the body of the Hall presents one of the finest rural scenes imaginable. The whole interior is decked with evergreens, hanging in graceful festoons, etc. The stand is a miniature grove of evergreen trees, large tropical and rare native plants, interspersed here and there with rustic seats and chairs, with an arbor in the background, mantled by the American flag. A circular table, some twenty feet in diameter, occupies the centre of the Hall, covered with boquets of flowers, an innumerable variety of dahlias, roses, verbenas, etc., all surrounding that exquisitely conceived "Temple of Flora," designed by Louis Pantlen. In the very extensive collection of H. M. Thompson, of Lake Forest, we noticed the cocoa nut, cinnamon, ginger, tea, coffee, sago, date, banana, olive, fig, pomegranate, India rubber, allspice, black pepper, lemon, lime, orange, pine-apple and cotton plant—several of them now in bearing. Mr. C. B. McCagg, of

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Chicago, exhibits a very rare collection, embracing some thirty varieties of plants from Brazil and the West India Islands. The *carrua indica*, of the numerous water plants, is the largest, standing some eight feet in hight. The *stanhapea sigrina* (or basket plant) is exceedingly rare and fragrant, and has a sixteenth flowering now for this season, a flag-shaped blossom of brilliant colors and delicate tints.

The gallery is entirely devoted to the exhibition of fruits, embracing an extensive assortment of every variety—some of each kind being immense in size, and others of very superior quality. As before stated, this is one of the grandest exhibitions of fruit ever held in this country, and will result in great good, from the mutual interchange of knowledge and experience among the various fruit-growers; and the visible proof of the superior character of our Prairie State for fruit growing, will inspire others to embark in horticulture.

We were agreeably surprised to see a very fair representation of the *agricultural* branch in the shape of numerous choice samples of vegetables, seeds, grain, etc., etc.

The Society deserves the success it is enjoying, and we hope and believe that the Annual Fair of this State Horticultural Society will hereafter stand high among the most important exhibitions of the kind in the country.—*Railroad Gazette.*

State Horticultural Exhibition.—The most sanguine member of the Illinois State Horticultural Society had not hoped for a better display of fruits, vegetables and flowers than is now to be seen at Bryan Hall, in this city. For several days previous to the opening of the exhibition, the managers were apprehensive that the general excitement pervading all parts of the country would prevent exhibitors from coming forward as they would were our national affairs in a different condition. They have been most happily disappointed. The choicest from garden and orchard and vineyard, from the confines of Egypt to the centre of Iowa, are here. The exhibition is pronounced by every one to be much the finest ever held west of Cincinnati. It is a decided success, so far as the *material* is concerned; whether it will result in a pecuniary success remains to be seen. For this it depends in a great measure upon the citizens of the city. We think it will, but it is too soon (Wednesday morning) to determine. On account of the great labor necessary to decorate so large a hall, and the few who gave their aid in the work, the exhibition was not opened for visitors till ten o'clock on Tuesday, and even then the work of arranging had but just begun. Many of the members did not arrive with their stock till yesterday morning, and some not even till to-day. It was a busy time for all concerned, but the arrangements, as they draw toward completion, are admirable, and show much skill and taste on the part of the managers. * * * * *

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This gathering will be of great importance to the horticultural interests of the West. How delightful a fact it is that the conflicts of men disturb not the processes of nature. The seeds germinate, the trees bud and blossom; the grain matures, the fruit ripens; earth and air and water and sunlight and warmth vivify the same as though nations had forgotten war, and peace reigned universal over the whole world. This exhibition in the Garden City is but an index of the capabilities of the State and the West, where intelligent labor and cultivated taste, combined with the natural resources of the virgin soil, are yet to make our country unsurpassed in beauty and loveliness.—*Prairie Farmer, Sept. 17th.*

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ILLINOIS STATE HORTICULTURAL SOCIETY.

OFFICERS FOR 1864.

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SMILEY SHEPHERD, Hennepin, Putnam County.

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At large—O. B. GALUSHA.....Lisbon, Kendall County, Ill.
1st District—JONATHAN PERIAM.....Thornton Station, Cook County.
2d " Dr. C. N. ANDREWS.....Rockford, Winnebago County.
3d " A. R. WHITNEY.....Franklin Grove, Lee County.
4th " J. H. STEWART.....Quincy, Adams County.
5th " W. A. PENNELL.....Granville, Putnam County.
6th " J. O. DENT.....Wenona, Marshall County.
7th " M. L. DUNLAP.....Champaign, Champaign County.
8th " O. M. COLMAN.....Bloomington, McLean County.
9th " C. C. STURTEVANT.....Beardstown, Cass County.
10th " JONATHAN HUGGINS.....Woodburn, Macoupin County.
11th " CHAS. KENNICOTT.....Sandoval, Marion County.
12th " E. S. HULL.....Alton, Madison County.
13th " T. J. EVANS.....South Pass, Union County.

CORRESPONDING SECRETARY.

W. C. FLAGG.....Alton, Madison County.

RECORDING SECRETARY.

C. W. MURTFELDT.....Rockford, Winnebago County.

ASSISTANT RECORDING SECRETARY.

PARKER EARLE.....South Pass, Union County.

TREASURER.

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ANNUAL MEETING, 1863.

The annual meeting of the Illinois State Horticultural Society assembled on the 15th of December, 1863, at Mercantile Hall, in the city of Alton, and was called to order by the President, Hon. G. W. Minier.

The Recording Secretaries being absent, J. E. Starr, of Jersey county, was appointed Secretary *pro tem.*

The President, G. W. Minier, then read his

ANNUAL ADDRESS:

Gentlemen of the Illinois State Agricultural Society:

Your Eighth Annual Convention is now in session. The Horticulturists of the city of Alton have invited and welcomed you to their hospitalities. Grateful for these exhibitions of kind regard, you will enter your annual labors with renewed energy, feeling that you are appreciated and that you are not toiling in vain. Nothing stimulates good men to virtuous action more than to know that their fellow men are in sympathy with them, and are grateful for their exertions. With profound reverence and gratitude, we all remember how a kind and merciful Providence has blessed the Horticulturists of our State the past year. Gardens, orchards and vineyards have yielded a more than bountiful supply. Our beneficent Creator has pointed out to us the way to be abundantly supplied with all necessary and luxurious fruits. He has led us, if not by a pillar of cloud by day and fire by night, by genial showers and glowing sunshine. Here, then, in the good city of Alton, and under the kind Providence of our God, you are to renew those labors which have already done so much to adorn and beautify your State.

Much has already been done, yet our work is but just begun. A more complete organization of our labors is desirable. Our widely extended State, or rather our longitude, demands that three divisions be made, in each of which certain fruits, vegetables and trees need to be specifically recommended. Northern, Middle and Southern Illinois each is a district in Horticultural practice, and must be so regarded. True, some trees, fruits, and plants are common to all; but in order to carry out the great good we wish to accomplish, each must have its boundary. A Committee for each district might be appointed to make out lists and revise them annually, for the benefit of these respective districts, and save valuable time to the Society.

Heretofore our Vice Presidents have had no definite labor to perform, though they have shown a zeal and willingness to labor when called upon, which convinces us that they are ready to bear their part. Could we not, with propriety, require from each a brief report of the fruit and fruit trees of his district, and charge him with the formation of auxiliary Societies, in the counties and large towns? I would also most respectfully suggest that we find our old members one by one called away. The old guard is dying off. Should we not seek for recruits? Your late Fair at the beautiful city of Rockford, was a success long to be remembered. Not merely in a pecuniary view, nor yet in the almost boundless and costly gathering of Horticultural and Floral products; but in the better success of a general public appreciation of your labor. The people of Rockford and vicinity have "shown their faith by their works" in the noble art of Horticulture. The plan and arrangements of Floral Hall and other parts of the grounds have been the subject of so many commendations, that they need no repetition here. To the people of Rockford and their garden belongs all the honor. In the midst of a cruel, causeless and unprecedented wicked rebellion, the absence of so many of our dearest friends and co-laborers, with but little encouragement from our great thoroughfares, you have accomplished results at once noble, encouraging and grand. Not in the destruction like the tornado or the battle-field, but like the dews of heaven and the genial rays of the sun, refreshing our land, and warming into a generous life. As your presiding officer, I solicited the

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Executive of your State to notice you in his last annual message, requesting, him, if he could not recommend a grant from your State Treasury, he would by doing so, give you an extended notice. Perhaps I should have added that many of his Legislators, not knowing the definition of the term Horticulture, might need a glossary, and this may have been the reason why we were not noticed.

No part of your transactions and labors deserves more thanks from the public at large than the progress made through your agency in the wide diffusion of cultivated fruits. In a sanitary point of view our people may well rejoice. In the comfort and luxury of living, without fear of evil effects, nothing can compare with the widely diffused and general, or rather universal use of esculent vegetables and luscious fruits.

From another stand-point, gentlemen, you are not understood. At the time your labors in Horticulture and Pomology commenced, there was very little carrying trade in fruits. Your railroads did little or nothing in this commerce. Now their reports show that many thousands of bushels are annually transported by railroads, and that thousands of dollars find their way to the coffers of these companies, which, but for your labors would never have been there. I request to remark here, that many of the companies have failed to see the benefit occurring to them through your efforts, or at least have failed, by courteous regulations to acknowledge the debt.

But the great good, gentlemen, which you are doing, and which must and will stimulate you to new and persistent efforts in the noble field which you have marked out for your labors, is the redemption of the million from the semi-barbarism in which they labor, to the nobler light of the cultivation of fruits, the adorning of house, and the training of flowers.

I insist that Horticulture is not only one of the fine arts, but the noblest of them. While the pencil of the artist may decorate your parlors, and the chisel of the sculptor make the marble all but breathe, it is the noblest business of the Horticulturist to infuse a true and exuberant life into verdant fields, and glowing landscapes. A country adorned with gardens, studded with clumps and belts of trees, and enriched with orchards, must be, not merely beautiful, but the true beauty of a cultivated taste, combining utility with loveliness.

Such a country must be not only desirable, but its people honored on Earth and blest in Heaven! Who doubts that our country may be made to surpass this picture! When Pomona will welcome to her cornucopia, and Flora entice to grottos of pure pleasures and pastures of living green, and almost primeval innocence and purity.

With such a work before us, hopes so exalting, and aspirations so pure, let us not falter, but (quoting with all reverence the Apostle's language) "Forgetting the things that are behind, and reaching forward to the things that are before, let us press toward the mark for the prize of our high calling."

The Apiary should form a part of every well regulated garden, and prosperous home.

Finally, gentlemen, as President of your Society, permit me to call your attention to the Ailanthus silk worm of China. This insect, which feeds upon the leaves of Ailanthus, a tree heretofore considered worthless if not noxious, spins its cocoons in the open air, and produces a silk more durable than any other. It has recently been introduced into France, and I am told successfully raised in our own country. Let this be inquired into, and if worthy, fostered by our Society. While we cultivate trees and flowers, let us have those insects, bestowed upon us by a kind Providence, which weave our robes from leaves, and extract our sweets from flowers.—[*See Report of Committee of Ag.*, 1863.

ESSAY ON THE PEACH.

By Dr. E. S. Hull, of Alton.

It may be considered an axiom in Horticulture, that all of our cultivated plants do best in a soil and atmosphere that most nearly resembles that of the countries of which they are natives; and that any great removal from those conditions, will require some difference of treatment at the hands of the cultivator. It is true that the peach will exist within wide limits of latitude, that in almost all sections of the world, where the severity of the winters do not kill the trees, or wherever the cold of the southern winters is sufficient to give the trees a period of rest, the peach tree will grow. There are facts, however, in vegetable physiology that are of the highest

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importance to the Horticulturist. To learn the conditions of success in the prosecution of any object is a step in the direct path.

Merely empirical efforts add nothing to the general store of knowledge, when many conditions are combined, and it can be of no permanent value to be able, from actual observation, to record all the changes or phenomena of a seed of the peach, from the period of its germination and growth, to give the elements that enter into its structure, or to be able to state with accuracy, the several ingredients and the exact proportions of each, of which the soil is composed—so long as the real cause of the action is unknown or unexplained, or the natural structure of plants is disregarded. Various results are produced by a deviation from the laws which regulate the formation of vegetable secretions. Light and heat are the agents, though not the only agents, upon which all plants depend, and as heat increases or decreases, so must the treatment of plants be varied to suit the altered conditions to which we would subject them.

Origin.—The peach is generally considered to be really indigenous only to parts of Persia and China, and from the former country to have been early introduced into Italy, and from thence to different parts of Europe, and into England about the year 1550; and from thence to Spain and France, and by the colonists into the United States. But whether the peach is really indigenous, only to the countries first named is a question we consider open to investigation. It was noticed by Father Hennepin, who was the first who has given us a description of the regions of Louisiana as it then was. In his voyage down the Mississippi river he describes the peach trees discovered by him in all these regions, as being of great size. Father Hennepin's statements, taken in connection with recent observations of the creole or native sorts, by which it is known that the trees of the more southern portions of Alabama, Mississippi and Louisiana bloom from two to three weeks earlier than either the seedling or improved varieties of the North when removed to these States, has led to the belief that those sections of country may justly claim the peach to be a native habitant of the Southern States.

Classification.—Botanists regard the Peach and Nectarine as only slight varieties of each other, differing only in the skin, with a perceptible prussic acid flavor in the Nectarine not contained in the former fruit. Many instances are recorded of both Peaches and Nectarines growing on the same tree and branch without any artificial aid. Horticulturists are, I believe, agreed in considering them as one species of fruit, which they have arranged in four divisions, viz: 1. Peaches whose flesh separates freely from both skin and stone. 2. The Free-stone smooth Peaches, or Nectarines. 3. The Cling-stone Peach, the flesh adhering to the stone and skin. 4. The Smooth-skinned Peaches or Nectarines, the flesh adhering to the stone.

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There are also other divisions necessary to be understood before any certain progress can be made in identifying varieties of the peach; these relate to the leaves, and are divided into three classes: 1. Trees whose leaves are crenated or sawed to a moderate depth, and have globular glands on the foot-stalk. 2. Those whose leaves are crenated and have ear or kidney-shaped glands. 3. Those whose leaves are deeply sawed or toothed, and are without glands on or near the foot stalk.

Let the horticultural student acquaint himself with these several characteristics, and then divide trees into sections, the one having large flowers, the other small flowers; he may then proceed with the examination of fruits, and will, with the aid of the distinctions named, be able to arrive at some definite results, and to give satisfactory reasons why this or that variety of fruit is the one under consideration. Without a correct understanding of these natural divisions of the peach, but little knowledge can be reached in the nomenclature of sorts.

English Modes of Culture.—To the English is due much that has been written of the growth and cultivation of the peach; but perhaps it is a little curious that we should have adopted so many of the principles of our trans-Atlantic brethren in the management of our trees. They have written treatise on treatise to demonstrate the course pursued in Britain; they have provided us with books descriptive of their modes of practice, and gardeners to reproduce in our soil and climate what they have learned at home. How preposterous it would be to introduce their modes of practice into this country will appear, when we consider that out of all the known species of fruits, only strawberries and gooseberries attain perfection in their climate, and that all other fruits require specific attention to secure a limited degree of success. In England where the sun can but seldom show a disc brighter than would appear to the beholder here when viewed through smoked glass, and where the moisture in both the ground and atmosphere is in excess, a coldness of the soil exists, the effects of which it becomes of the first importance to guard against; hence we find the English gardener reducing the roots of all plants to one type, that of the fibrous rooted, that they may not penetrate to so great a depth, as to be below the influence of the warmth imparted to the soil by the sun's rays.

Not Adapted to Our Climate.—Here, where in the main the temperature of the earth exceeds in warmth that of the atmosphere, we have followed the example of our English cousins, and received our trees from the hands of the nurseryman after the foreign sample, nor does it appear that we have ever thought best to inquire into how many natural divisions the roots of trees are divided, or the reason that has induced the English to disregard those divisions. How few, either of our orchardists or nurserymen, who have bestowed much thought on the natural requirements of the peach tree, or fr once considered the nature of the roots with which they

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have to deal. They commonly suppose that trees with a mass of fibrous roots, are such as are best suited to their wants, without recognizing the fact that nature has made the roots of all our cultivated trees of two types, viz: the one with tap roots, or with its main root extending perpendicularly downward to a great depth, those portions below the soil very much resembling the branching of a tree whose main stem or trunk tapers regularly to the top, (this model or type is called deep feeders or tap rooted, and to this type the peach root belongs,) and the other model known as the forciculated or fibrous rooted, or surface feeders, being destitute of the main or tap root, and dividing just below the surface of the soil.

No models could be devised that would so clearly indicate the requirements of the two classes of roots as those described. This difference in the formation of roots may be made serviceable to the horticulturist in several ways. When the trees of both types are planted near each other, each will seek as much of its nourishment as though the other were not present. The deep feeder will draw its food deep down in the soil; the other, owing to the more complete division of its roots, branching laterally just below the soil, reaching out in all directions, without penetrating to any great depth. The surface will, when growing vigorously, destroy all within their reach. By a proper mingling of the two, two plants may literally be said to grow where only one grew before. Hence it is in bringing forward an orchard that advantage should be taken of the kind of roots we cultivate.

For example, most persons wish to grow some crop under the trees until they are so far advanced as to take possession of the soil. Only such plants as are of the opposite type should be used. Corn and potatoes are found to do well among peach trees. Corn, deriving all its food near the surface, is of all things considered the best crop to plant, and the one generally employed. It would be far more valuable for the object named than it is, but for the practice so universally adopted, of forcing the trees to become surface instead of deep feeders. To this wholesale mutilation and deprivation of the natural structure of the peach tree is due many of the failures and diseases now so common in this country.

This tree, by nature so well adapted to our climate and soil, and so admirably fitted, by its peculiar structure, to draw its support from a depth rarely affected by drouth, has, by reason of being

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out by the discussions. It is of the first importance that the soil should be deep, rich, and free from an excess of moisture to as great a depth as the roots of the trees will penetrate. If these conditions cannot be secured, better not plant at all; otherwise the attempt will cost more than the fruit will be worth. No peach tree should be planted in ground not moved to the depth of at least three feet; and if holes are dug instead of loosening the whole ground, they should be dug at least five feet in diameter, and filled with good soil; and not less than one good wagon load of manure should be mixed with the earth of six or seven holes at the time of filling up.

Planting.—Having your trees ready and the bruised ends of the roots smoothed off, spread out the roots in the soil where they are to remain in as natural a position as possible; then fill in the soil, not permitting the manure to come in contact with the roots, pressing the soil about them as you proceed, until the excavation is filled even with the surrounding surface. If the tree has been planted in a hole, the earth will settle with the tree about three or four inches. If, however, your planting is to be done in ground, the whole of which has been deeply worked, you may put your tree three or four inches deeper than it stood in the nursery.

Since it is true that our chemists agree that barn-yard manure contains all that is essential to the welfare of our fruit trees, you may make as liberal a use of it as either your convenience or purse will allow, and that, too, without troubling yourself a great deal about the specific ingredients so much needed in the development of healthy trees.

Pruning.—We should recollect in pruning our trees that to the healthy action of the leaves we owe much of our success in fruit growing. They collect through the medium of the roots and atmosphere all those ingredients so necessary to the vital welfare of the plants; the crude juices which are taken up by the roots, and all the food they absorb from the air, in them undergo that chemical change from which the structural cells are formed. Most of the improved varieties of the peach have larger leaves than are produced by the healthy seedlings, which will direct your attention to the fact that as they must, in proportion to their increased size, be fewer in number, they must be carefully cared for. If the tree

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No art can produce the sugar and certain flavors of fruit due to the agency of light and heat, nor can it impart that degree of health due to those agents, hence it should always be remembered that no two leaves should be allowed to so far compete for light as to lessen their utmost limits of growth.

One other remark and I am done, viz: Were I called on to describe the two conditions of success of the most importance in the growth and management of the peach, I should say, first, do all in your power to restore and encourage the deep rooting of your plants; and, secondly, to the pruning of the trees on the principle herein described. To these add continued stirring of the soil during the period of growth; the judicious thinning of the fruit; the removal of borers, etc., etc. Other conditions being favorable, your success will be certain.

To this paper I have added the varieties of the peach which I would select for orchard culture. They are named in the order of their ripening: 1. Serate Early York. 2. Haines' Early Red. 3. Large Early York and Crawford's Early. 4. Bergen's Yellow and Old Mixon Free. 5. George the Fourth and Crawford's Late. 6. Late Admirable and Columbia. 7. Smock. 8. Heath Cling.

The President presented the following communication of Wm. H. Van Epps, President of the Illinois State Agricultural Society:

ILLINOIS STATE AGRICULTURAL SOCIETY,
PRESIDENT'S OFFICE, DIXON, ILLINOIS, *December* 14, 1863.

G. W. Minier, Esq., President Illinois State Horticultural Society:

DEAR SIR: It is thought by many friends that the meeting of the Executive Board of the State Agricultural Society in Springfield on the 5th of January next will afford a favorable occasion for the expression of views and the discussion of plans for the organization of a State Agricultural College. As you are aware, much has already been done in this direction; yet much remains to be done. The Governor is already in possession of the scrip for 480,000 acres of land, being the amount to which this State is entitled, so that the endowment is secure. It will, probably, not be practicable to dispose of this scrip, realize the fund and organize the institution until after the next meeting of the Legislature, which will not regularly take place before January, 1865, unless the Supreme Court should decide the present body still in session; and if so, how pressing the necessity that early deliberation and efficient action should be had by the friends of the measure. In the mean time, should not those who feel an interest in this great cause devote themselves earnestly to the work of maturing a plan, upon which, when the time shall arrive, it will be safe and easy to proceed? Believing that your opinion and suggestion will materially aid those having charge of this *valuable trust* in arriving at correct conclusions in this matter, I therefore hope it will be your pleasure to give them to me by letter, or that you will be present at the meeting referred to, and there express them. Should there also be a delegated industrial convention from the various county societies of the State, held at Springfield at the same time, as has been urged through the agricultural press, what more fitting occasion could possibly occur to obtain an intelligent expression upon this vital educational question, as well as to give efficient direction and tone to industrial interests and wants of Illinois. And now allow me, sir, to present to yourself, the Executive Board and Horticultural friends who will be in session at Alton, my sincere regrets that my engagements are such as to deprive me of the pleasure of being with you on that occasion, and enjoying the intellectual feast always in store for those who attend the winter meetings of the Illinois State Horticultural Society. Hoping that this lengthy communication may be considered as addressed to each and every one of your worthy co-laborers, and that at the close of your deliberations, a unanimous resolve to meet at Springfield on the 5th of January next will prevail,

I remain, sir, very sincerely, yours,

WM. H. VAN EPPS.

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ON THE CULTURE OF THE BLACKBERRY.

By N. J. Colman, of St. Louis, Mo.

But little attention has been paid to the culture of the Blackberry till within a few years past. Some few individuals had taken the common plants from the woods, and planted them in their gardens, but obtained little if any fruit. The plants would make a vigorous growth of canes, but be unproductive. Such has been the result of my own experiments with them. A great many instances of similar results have come under my observation. My neighbor, the Hon. Edward Bates, who is nearly as able a horticulturist as he is a jurist and statesman, and who loves horticulture with an untiring devotion, obtained plants from the woods bearing the largest fruit, and transplanted them to his garden, and bestowed careful culture upon them, but could never succeed in getting fruit.

A great many horticulturists even, when spoken to on the subject of Blackberry culture, will tell you they want none of the improved or cultivated kinds; that they can go the woods and get plants and transplant them in their fruit gardens, and they will bear fruit which will surpass the New Rochelle. We fear these gentlemen are mistaken. We believe they have not tried the experiment. If they had they would tell a different tale. There may be kinds to be found in the woods which will surpass those in cultivation. But to go into the woods and take up the plants promiscuously, or to take up the plants that bear the best fruit, and expect them to succeed well and bear profusely in the open field and under the hand of culture, is to expect in vain. The common varieties growing in the rich leaf mould of the woods, with a heavy mulching of leaves covering the roots and keeping the soil always moist, and growing in the shade of forest trees, may bear profusely under these favorable circumstances. But how different is the treatment they receive when planted in the open field, subjected to the burning sun and drying air, and in a drying soil, without a coat of leaves or other mulching to keep it cool and moist.

It was not until the variety now known as the New Rochelle was discovered and brought into notice by Mr. Lawton, that Blackberry culture was prosecuted with any degree of success. It was found that this variety, among its other excellent qualities, would bear enormously when subjected to cultivation like other fruits. We consider it far superior to any variety in cultivation that we are acquainted with.

The Dorchester we have cultivated and have given it a thorough trial, and find it far inferior in size of fruit and in productiveness to the New Rochelle.

Newman's Thornless has been greatly exalted by certain interested parties. We think it was wrongly named. It should have been called Newman's Fruitless. From hundreds of plants that

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we have had in cultivation for five years past, we have never obtained a pint of fruit. We are not acquainted with a greater humbug in the fruit line unless it be the white varieties of the Blackberry. We have tried the Crystal, the Albino, and two or three other white kinds, that have been highly puffed, and they are almost fruitless. Sometimes we do get a few berries, but as a class we condemn them entirely and decidedly.

Soil.—The Blackberry delights in a rich, rather moist, soil. It would be almost impossible to get a soil too rich. We have seen a portion of a blackberry patch receiving the wash of the barnyard and the canes grew to an immense size, and produced the largest berries we have ever seen, while the quantity borne was almost incredible.

Preparation of the Soil.—The soil should be deeply plowed and trench-plowed in the fall. By trench-plowing the soil is deepened and a portion of the sub-soil is brought to the surface, where it is subjected to the ameliorating influences of the frost, air and sun. In February or March the ground should be again plowed and the sub-soil or lifting plow used, which breaks up the sub-soil without bringing any of it to the surface. We are satisfied from our own experiments that this thorough preparation of the soil will be amply rewarded by the increased amount of fruit produced.

Time and Manner of Planting.—The best season for planting the Blackberry is autumn, if the soil is in a proper condition. The The Blackberry commences growth very early in the spring, and if disturbed at this period by transplanting is very liable to die. None of the small fruits so imperatively demand planting in the fall or very early in the spring. If the plants can be set out early in March or in the first opening of spring it will answer. But if the planting is delayed it will be at a sacrifice of a large portion of the plants.

The plants should be set out in rows eight feet apart, and the plants should be set two feet apart in the row. Give the ground between the rows good deep culture the first season, and the second keep all weeds down, not working deeply between the rows. Strawberries may be grown between the rows the first two years if preferred. Let the plants come up thickly in the rows, but cut off with a hoe, even with the ground, all suckers that come up between the rows, treating them as weeds. The plants coming up thickly in the rows form a kind of hedge, the canes mutually sustaining one another, thus rendering stakes and trellisses and the trouble of tying unnecessary. We have practiced this system with great success, and those who have seen our patch in fruit say the yield was enormous. There is no care or labor required in training by this method. Those who go to the expense of procuring stakes and setting them, and then tearing their flesh to pieces in tying up the canes, would avoid the trouble after trying the plan we recommend.

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PRUNING.—The only labor required by this method of treating the Blackberry is in pruning. This is done in summer. When the plants send up canes four or five feet high go over the patch with a corn knife and cut off the tops of all the canes to the hight of about four feet. This will cause them to throw out laterals upon which the fruit is produced. The plantation must be gone over several times during the season as new canes are rearing themselves and their tops must be cut off as before recommended. If the laterals get too rampant and in the way as they will, they must be shortened in. The only implement required for this work is a corn knife, and one man will prune several acres per day in this manner.

I would particularly recommend that after the plantation is established the ground between the rows should not be disturbed. It will break the roots and cause an immense amount of suckers to put forth and greatly weaken and lessen the productiveness of the bearing canes. The best plan is to spread a heavy mulching of straw, or, what is better, coarse manure, between the rows, thus keeping down the weeds, rendering the soil moist and enriching it at the same time.

CULTIVATION OF FOREST TREES ON THE PRAIRIES.

By O. B. GALUSHA, of Lisbon, Ill.

The benefits which would result from a systematic and extensive culture of Forest Trees on the nude prairies of our State are so manifest and varied that even an enumeration of them would require more time and space than should be occupied in a single essay.

While much has been written, and wisely too, of the beauty such a system of tree planting would add to the landscape, and many pictures have been drawn in our imaginations of these wide prairies thus converted into one great and beautiful garden wherein would grow, in greatest perfection, every variety of trees, cereals, fruits and flowers which the richest soil in the world, with a climate thus ameliorated, would produce—while these thoughts and many others akin to them arise in the mind, they should inspire us to renewed diligence in our efforts to approximate toward so desirable an end, yet thoughts of the long detail of labors, the alter-

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to a consideration of the *pecuniary* compensation resulting from the cultivation of Forest Trees upon the prairies of Illinois.

The question which comes home to every prairie farmer is "will it pay *me?* If not, is it my duty to labor in this direction for the benefit of posterity or to promote the ultimate good of the State?"

I will examine these questions in as brief a manner as may be, and endeavor to show *how* tree planting should be conducted to secure a compensation to the planter and result in *incalculable good to posterity.* The planting of trees in belts for *screens* or *protection* will, in a *few years*, compensate for cost, while those planted for *timber*, for building, fencing, and various other purposes, will, of course, require many years of patient waiting before the end will be gained. Yet while growing for *this* purpose they will, in part, remunerate the planter, by the shelter from the winds which they will afford. I will, firstly, make some *approximate* estimates of the *cost* and *compensation* of timber belts for protection only.

It is obvious that to secure the largest benefits from such protection it should be quite general, and as we examine this subject we shall see that perhaps no legislation would secure greater pecuniary prosperity to the State than a law which would require every owner and cultivator of a prairie farm to plant and protect at least twenty rods of screen annually, until all the subdivisions of the 40,000 acres of prairie land in our State were thus bordered. Although *such* a uniform system may not prevail, yet every man cultivating his farm of forty acres or more may make such an investment profitable, even should his neighbors fail to copy his example.

Let us first consider the most *effectual belts* for protection, viz: those consisting of *evergreen trees.* The American Arbor vitæ is one of the most available trees for this purpose, bearing transplanting with almost perfect safety, flourishing in nearly all situations and forming by its compact growth an almost impenetrable windbreak. Good transplanted trees of this variety, two feet high, can be procured at our home nurseries at ten dollars per hundred. The ground to be planted should be prepared by trench-plowing in the fall and the trees planted in the spring, in two rows ten feet apart, with the trees from six to ten feet apart in the rows, placing the trees in the second row opposite the spaces in the first row. When well established they will grow with good cultivation about

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use of the land will be fully returned by the protection they will afford during the time. We thus allow twelve years from the time of planting for its development into an effectual screen, although the growth will continue for many years thereafter, which will, of course, enhance its value.

The Red Cedar is also a very desirable variety, costing about the same price and requiring the same treatment.

The Norway Spruce doubtless combines more good qualities than any other tree for this purpose. It costs at present about twenty dollars per hundred for trees two feet high, but it grows to a much larger tree than the Arbor vitæ or Red Cedar, and may be planted at greater distances. Twelve to fifteen feet would be the proper distance. This variety bears transplanting safely, grows rapidly, forming a perfect pyramid of dense foliage one hundred feet high, with a base twenty-five in diameter. As it retains its lively color during the entire year, a belt of this variety presents a most beautiful appearance. It will be seen that when planted at the distance named the lower branches will interlock for a considerable distance from the base.

The White, Austrian and Scotch Pines are all very desirable trees for belts. They may be planted at still greater distances, as they form broad, majestic forest trees, which will effectually check the force of the air currents for a quarter of a mile or more. These trees are not transplanted with as much certainty of success as those before named, though by adhering to the following directions but few will fail.

In transplanting Evergreens two precautions are necessary to *insure* success, viz: 1st. Take them up with care, preserving as many of the roots as possible. 2d. Avoid the drying of the roots by exposure to the air. Even fifteen minutes in a dry atmosphere would prove fatal to very many trees. The roots should be puddled as soon as taken from the ground, and packed away in moss or damp straw until wanted for planting, which should be done with as little exposure as possible. They should be planted in finely pulverized, damp (not wet) soil, spreading out the roots well with the extremities a little lower than the centre, filling all the interstices and pressing the earth moderately firm above them. Treated in this manner not one tree in fifty will fail to grow. I

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white birches; blue and white ash; Lombardy poplar; and white and black walnuts. The willows and poplars are easily raised from cuttings, and may be planted quite closely, when immediate protection is desired. The others require from ten to fifteen feet, according to their habits of growth.

The mode of cultivation already given is proper for all these varieties, excepting that with the most rapid growers the mulching may be dispensed with. I regard the *White Willow* as the most desirable of all deciduous trees for this purpose. The cuttings seldom fail to strike and grow with astonishing rapidity, forming straight, symmetrical trees, of large size and dense growth; and is the most tenacious of life of any tree within my knowledge. As our prevailing winds and those most disastrous to field and orchard crops, blow from points several degrees west or east from the meridian, it is obvious that the protecting belts should extend north and south; and for convenience, as far as the nature of the ground will admit, along the lines of eighty acre lots, making four screens upon each section. If we estimate the average cost of deciduous trees at ten cents each, all other expenses at five cents each, it will cost $576 to protect a section, as above, with belts of three rows each.

In the teachings thus far, nothing has been allowed for protecting the young trees from injury by animals. If true economy were practical, by inclosing our animals instead of the present foolishly extravagant custom of fencing in our crops against the animals, this expense would be obviated. But since this practice prevails, we must allow four miles of fence upon each section for this purpose. Fence suitable for this may be made at an average cost of seventy cents per rod; but as it will be worth nearly half price, when no longer needed for this purpose, we will allow forty cents a rod for such a fence, making $512 per section. The entire expense of the four belts at twelve years old will thus be $1,088. We will now estimate as nearly as may be the saving upon one section in the simple item of grain crops. Supposing half the land to be in grain, and the average value of the crops to be only *ten dollars per acre*, and estimating that one-twentieth part only of the crops is saved by these wind-breakers, and we have an annual net profit of $160. All who have devoted much thought and observation in this direction, will agree that a larger proportion than one-twentieth would thus be saved. How often do we learn of one-third or one-half the crop of an entire township or county being blown down and destroyed in a single storm.

Thus we find that these screens will pay all expenses in seven years, or when at the end of nineteen years; and who will deny that they will then be worth twice their cost, either to stand for the same purpose, or to be cut down and devoted to other uses. But the saving in the grain crop is not the only profit they would afford. How often do we hear the remark that fruit is abundant in,

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and adjoining the timberlands, while full crops are very rare in orchards planted upon the open prairies; and there is much of truth in such statements. Indeed there can be little doubt that such belts as those described, would add one-third to our fruit crops. They would, also, by checking the force of the winds in winter cause a more even distribution of snow over the surface of the ground, thus protecting and preserving fields of winter wheat and very many varieties of tender plants. Again, would not the hundreds of thousands of cattle which are now left to shiver in the cold wintry blasts, be grateful for the shelter which these belts afford? to say nothing of the pecuniary benefit to the owners, in the saving of the large amount of grain-fuel requisite to counteract in part the chilling effects of such exposure.

There is another highly important result which would follow from the general system of tree planting first hinted at, which, although in perfect accordance with nature's laws, is seldom thought of in this connection, viz: A more even distribution of rain over the surface; and it is a fact which every person who is at all familiar with the laws of electricity will admit, that in this respect alone, such an enterprise would prove a profitable one.

We have thus far considered this subject of timber belts mainly as checks or barriers to the air currents, and have seen the immense profits which would result from them; we may still add materially to their profits by planting varieties of trees, which will subserve other purposes. Thus the white and black walnuts will afford you the luxury of their fruit. (These varieties should be raised from the nuts, planted where desired to remain, as they do not bear transplanting well.) Again, by planting six rows of white willows, they will grow in ten or twelve years of sufficient size for hewing timber, fence posts, rails, fire wood, etc.; and by judicious cutting and alternating with each half as often as of sufficient size, a constant supply of timber may be procured from them, and still preserve three rows well grown. This variety grows readily from the stump, so that a succession of crops may be taken from the same roots. The *Ash-leaf Maple* (*acer negundo*,) already named as a valuable tree for protection, has also a sap rich in saccharine matter, and from which excellent sugar is readily made. This tree grows very rapidly, even more so than the white maple, and bears transportation without the loss of one in a thousand, and is adapted to all parts of the State. It will be large enough to be tapped in from six to eight years from transplanting. Experiments made by many of our most reliable citizens fully sustain the statements which I laid before this Society, at its meeting last winter, relative to *its valuable properties as a sugar tree.* These experiments all combine in proving that the sap of this tree is fully as abundant and of equal sweetness as that of hard maple. That it granulates very readily, making a sugar of excellent quality, similar in flavor to that made from the old sugar

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tree. A belt of these trees must be regarded as one of the most profitable parts of a prairie farm. As the farmer is otherwise comparatively at leisure during the season of sugar making, he may manufacture and stow up a year's supply without neglecting any of his ordinary farm labors. As this tree is destined to be largely planted for these combined purposes, I will give in a few words the details of its propagation. Like the white and blue ash it ripens its seeds with the first frosts of autumn. They do not drop, but should be gathered from the tree soon after the foliage is destroyed, and may be sown at once, or stored in small bags or boxes in the cellar until about the first of March, when they should be placed in boxes or barrels in thin layers, alternated with layers of damp moss, old sawdust or earth. They will gradually swell and should be sown as soon as any of them show sprouts. Sow in narrow drills quite thickly, and transplant at one year into nursery rows; after two years' cultivation in the nursery rows the trees will be six feet high and ready for the belt or orchard. When these trees are planted solely for the purpose of sugar making, they should be set in the form of an orchard, sixteen or eighteen feet apart each way, and the same ground may be planted with corn for two years, arranging the rows of corn in line with the rows of trees, so that each tree will occupy the position and stand in place of a hill of corn.

We will lastly consider the cost and remuneration of raising *timber in groves* for the purpose of building, fencing and fuel, selecting a tree as the basis of these estimates, which, while it is the most cheaply grown, is also susceptible, perhaps, of being used for as great a variety of purposes as any one tree within our knowledge, viz: the *White Willow.*

We will briefly make an approximate estimate of the cost of fence posts of this variety. Land for this purpose can be purchased at an average price of ten dollars per acre. The interest at ten per cent. upon the cost of eighty acres will be $80 per year. The expense of fencing the same upon two sides, at $1 per rod, $240. Breaking and harrowing, at $5 per acre, $400. Fifty thousand cuttings (allowing some for waste) making four to the square rod, or eight feet apart each way, at $4 per thousand, $208. For planting, $80. For filling vacancies, $50. Cultivation for four years, $800. Interest on expenses, aside from the use of the land, through the twelfth year, say, (without a definite estimate) $1,170. This gives the entire cost of eighty acres of trees, eight feet apart, twelve years old, at $3,044. At this age the trees will make eight posts each, deducting 1,200 for missing trees, and we have 50,000 trees, making 400,000 posts. The expenses of cutting and splitting will be met in the value of tops for fuel; but for safety we will add $1,000 for the balance of expenses in cutting, making the entire cost, at liberal estimates, of the 400,000 at $4,044 or a fraction more than one cent each. As before remarked, the next crop would grow from the stump without expense and in a shorter time.

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Astonishing as these results may seem to many, yet no one who knows the habits and value of this tree will consider these estimates of profits as in the least exaggerated, but on the contrary, the amount allowed in the last estimate for cultivation may be entirely saved, during the first two years, by planting corn among the trees, as described for sugar orchards. The rows being eight feet apart, would admit of a team passing through to carry out the shocks of corn. We might, in the same manner, estimate the expenses and returns of such groves of timber when used for other purposes. Thus, allowing only half the above number of trees to stand upon the ground, at fifteen years from planting, they would furnish hewing timber standing at eight mills per running foot, or lumber sawed and delivered on the ground at less than six dollars per 1,000 feet. But I will not tax your patience by making farther estimates. Those already given are the result of close observation and inquiry of the habits and uses of the various trees mentioned, with an experience of about twelve years in the cultivation of most of the varieties. I invite a candid examination of the details of the subjects presented, in full confidence that such an investigation will induce any one who is the owner of a prairie farm to increase his diligence in planting trees for permanent groves and belts. Let us, who are members of this benevolent association, encourage this important enterprise by keeping its advantages as much as possible before the minds of the people. Let those of us who are engaged in the nursery cultivation of trees suitable for these purposes, furnish them to the planters at fair, remunerating prices, rather than dispose of them at wholesale to speculators, who, by demanding exorbitant prices, would deter many of the most worthy and enterprising cultivators of these prairies from purchasing at all. One of the happiest results of this terrible war through which we are now passing is, and will be, to increase in the breast of every true-hearted man a real love for his country, causing him to identify his personal interests with those of his State and nation, and to regard every enterprise which is calculated to promote the prosperity, both present and future, of the whole people, as his own individual work. Let us as a society foster this large-hearted benevolence, and endeavor to direct it into such channels as will secure the largest prosperity to the beloved State.

THE BOX ELDER—AS A SUGAR TREE.

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ed sugar, I now present to you my doings in the premises, together with such other information as I have gained from intelligent reliable persons in regard to its saccharine qualities.

I. Hindered by circumstances that I could not control, I was not able to commence operations until the 22d of March, when the sugar season was well nigh past. The flow of sap was abundant, and of similar quality to that of the sugar maple. Whether the saccharine qualities of the sap varied according to the earlier or later period in which it is drawn, I could not verify; but the appearance of albumen in the sap, with the large proportion of lime held in solution, indicates that it is subject to the same laws that affect the sugar maple.

II. Evaporation produced a molasses and sugar in every respect in taste and appearance, like the sugar maple. The quantity and quality, comparing, so far as I could judge, without varied and extensive trials, were exactly with the product of the maple under similar circumstances.

From information derived from intelligent persons, having some knowledge of its adaptability to produce sugar, (their knowledge was from its common use for that purpose in different States,) it would seem that its sap is hardly equal in richness of saccharine matter to that of the maple, but that the sugar made from it is equal in every respect.

From the limited experiment I made, and the information I have obtained from various sources, I cannot hesitate expressing the conviction that its value, in an economical point of view, will soon commend it to very general favor in our prairie State. The ease and facility with which it may be propagated from seed, will render it cheap. Its vigor of growth, cleanly habit and perfect adaptation to the soil of the prairie, fit it most admirably for those sheltering wind breaks that our farms now call for.

As the State Horticultural Society is fast becoming good authority, on many subjects connected with social and domestic economy of the good people of Illinois, I respectfully suggest as subjects for further inquiry by your worthy body, that each one to whom these presents comes, constitute himself a committee to ascertain, by experiment, the relative value of the product of sugar in quantity and quality, from the Box Elder, compared with sugar maple. Is there any difference in any respect in the product of the pistillate and staminate plants of the Box Elder? How long will it require it to attain the diameter of one foot, where it has the advantage of good prairie soil to grow in? In short, let each look up clearly ascertained points that should go to make up a judgment of its value as an economical resource for one of the *luxurious necessaries of life.*

These points will be called for and deemed important at coming meetings of our society, preparative to a public expression of opinion. Should each one be diligent, according to his opportunity,

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such facts can be gathered up as will be sufficient data for our regular action, in either approving and recommending it to the public, or in deciding that it is unworthy of any special regard.

The nurserymen, as in duty bound, will doubtless see to it that immediate measures be taken to have such supply on hand as when the demand comes, our honest farmers can get a supply without having their sugar made bitter by tasting the price of the willow, as a premium for their indulgence.

[Nuttall in his part of the Sylva Americana, notes the fact of this being a sugar tree, but pronounces it inferior to the sugar maple.]

AMERICAN WINES.

By George Husmann, of Hermann, Missouri.

Mr. President and Gentlemen of the Illinois Horticultural Society:

You have invited me here, a stranger, to read to you an essay on American Wines, and I must say have, I am afraid, sorely mistaken the man when you invited me to give you information on that subject, as I am no wine connoisseur. I am wholly unable to dissect a wine if set before me; to point out its peculiar excellencies and its defects. I can only say, when I find and taste good wine, that I like it, and when I taste a poor article, I do not. Truly, were the theme not so inspiring, I would not undertake it all. But who can think of wine—the pure juice of the grape—*nota bene*, good wine—without feeling in some degree elevated; and thus I will trust to the subject to do itself justice, with what little experience I may have to back it up.

First, I am told I am to say something about good wine making. This is a very simple process; but to make good wine, you need, 1st. Well ripened grapes. 2d. Good, clean vessels and casks. 3d. Careful hands to gather and press the grapes. 4th. A good cellar to keep the wine. I will say a few words upon each of them.

First. It is essential that the grapes, to make the wine, should be well ripened. It is not enough that they are well colored. But after coloring, they should hang four to six weeks longer, until some of the berries begin to shrivel on the vines. This is essential to make the wine of good body, and give it that delicate flavor and aroma, which connoisseurs designate by the name of "bouquet."

Second. Good, clean vessels and casks. We may as well here include the wine-press and its apparatus also, as shears or knives for cutting the grapes; in short, all the tools, which are called vintner's utensils. They consist of, 1st. Good, clean tin or wooden pails. 2d. A vat to carry the grapes to the press, high and flat on one side, which is carried on the back by two leather straps going over the shoulders, wide at the upper end and narrow at the bottom. 3d. A large and wide vat or tub, called the fermenting vat,

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say seven feet wide by three feet high, with a faucet on one side near the bottom to draw off the must. 4th. A mill to mash the grapes. 5th. The press. These two can be bought of a very convenient size and form, manufactured by Gaiss & Brosius, Belleville, Illinois, at about $70, which are very handy, and unless a very large quantity is to be pressed, will answer every purpose. 5th. Casks of sufficient number and size to suit the quantity of wine to be made. The most convenient size is from 150 to 250 gallons each, as they will not occupy as much room as smaller ones, and are yet small enough to be handled with ease. They should have a so-called door at one end, to facilitate cleaning. If new casks cannot be had, those in which Rhenish wine has been kept, Malaga casks or brandy pipes, will also do, but they should be in good condition, not soured or spoiled by lying around empty. New casks should be scalded with boiling water, before the must is put into them.

Third. Only careful hands should be employed to gather the grapes. This is very important, as all imperfectly ripened berries, as well as all decayed and dry ones should be carefully picked out. The half ripe berries may be put into a separate vessel, to make an inferior wine. This is generally done while cutting the bunches, when all berries which are not perfectly ripe and sound are picked out by hand. They are then carried to the mill, which is generally set above the fermenting tub, on a frame, and run through the rollers into the tub, where they remain until pressed, say, in ordinary weather, about twenty-four hours. If left longer, they will make a darker colored, more astringent wine, which is not so pleasant to drink at first, but will keep longer and improve by age; if pressed immediately, they will make a lighter colored wine, which is very pleasant to drink the first year, but will not keep as well. Before pressing, draw off the must from the fermenting tub, which can be filled into the casks at once, and press the remainder. Some keep the two separate, but I think they are better if mixed, as one improves the other.

Fourth. The wine cellar. This is very important, as without a good cellar, you cannot expect to keep your wine. It should be dry—enough below the ground to keep an even temperature in summer and winter. It is generally made in the north side of a hill, and arched over, say twelve feet deep, so that the door is even with the ground, with abundant ventilation, to keep it dry. The casks are laid on wooden frames, leaving abundant room to get between the two rows, and about three feet from the ground. They are then filled with the must, some preferring the *under* fermentation, that is, not filling the casks quite full, so that when the must ferments everything will remain in the casks; others preferring fermentation *above*, *i. e.*, filling the casks full, so that the skins, etc., which may yet be in the must, may be thrown out of the bung hole by the fermentation. Both methods have their advantages, but I

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prefer the latter, with a very simple contrivance to exclude the air. This consists of a tin tube, bent in the form of a double elbow, of which one end fits tightly in the bung hole, and the other into a dish of water, to be set on one end of the cask, through which the gas escapes.

The wine then remains in the casks until fermentation is over, when the bung is closed tightly, and it is left until perfectly clear, when it may be racked off into other casks. This should be done in February or January. Rack it off into good, clean casks, taking good care to thoroughly scour the casks in which the must has fermented, as the lees of the wine are very slimy, and must be carefully scrubbed off. A second fermentation will ensue in May or June, after which the wine should be racked again, and it is then fit to bottle or remain in the casks.

This is the simple process of wine making. But now the wine is made, we come to the testing, tasting, classifying. And this, gentlemen, although a very agreeable task, is yet a difficult one, and takes a man much more scientifically learned than your humble servant. As, however, you have imposed the task upon me, I must even try, to the best of my poor ability, to get through with it, and trust somewhat to impudence, but more so to the inspiring nature of the subject. I will divide our native wines into three classes. First, dark red wines. Second, light colored wines, or grade red. Third, white wines.

Class One, No. 1.—*Norton's Virginia*—This, I think, justly takes the lead among American wines, at least among those of its class. Specific gravity of the must, generally from 95 to 105; of dark color, resembling Burgundy, somewhat astringent, of great body, and improves with age; not hard to take, if we believe the majority of those who try it, and, if we believe the doctors, of great value as a medicine. Price, generally $2 50 to $3 per gallon.

No. 2.—*Cape, or Schuylkill Muscadell*—This, I am told, also, makes a heavy dark red wine, and has often been praised by our Cincinnati friends. I have never tasted it, therefore cannot say much about it.

No. 3. *Cynthiana*, or *Red River*—Closely resembles Norton's Virginia. Specific gravity of the must about the same. Wine not quite so dark, but of great body and fine flavor. Not much tried yet.

No. 4. *Arkansas*—Closely resembles the foregoing; not much tried, but will make a superior wine.

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The Ozark varieties, introduced by Mr. Frederick Muench, will also make a fair claret wine, but the grapes are too dry, therefore do not produce much.

Class No. 2—Light Colored Wines—Includes those whose color depends much on fermentation on the skins, and can, therefore, be changed from yellow to brilliant red.

No. 1. *Delaware*—Specific gravity of must, 90 to 100. Makes a wine of great body, strong flavor, and but little acidity; too little, perhaps, to please European palates, but perhaps all the more acceptable to Americans.

No. 2. *Cunningham*—Specific gravity of must, 95 to 105. Makes a strong, very delicate wine, which often remains sweet after fermentation, and will, I think, command almost any price in market, if made in sufficient quantities. Pleases my taste better than the Delaware.

No. 3. *Herbemont*—Specific gravity of must, 85 to 95. A delicate wine, of a good deal of body, and aromatic, spicy taste, has often been compared to Madeira. It also makes a fine wine if mixed with Norton's Virginia. Price of wine $1 75 to $2 00 per gallon.

No. 4. *Catawba*—This is so well known that it hardly needs description. Specific gravity of must varies from 75 to 95, according to season. Makes a good still wine, resembling Hock, but with strong native flavor, and a good deal of astringency. Price $1 25 to $1 85.

No. 5. *Concord.*—Specific gravity of must, 78 to 90. A very agreeable light wine, with a peculiar almond flavor, and a brilliant color. Will become very popular when better known, and makes also a very fine wine, if mixed with Norton's Virginia.

No. 6. *Diana*—Said to make very fine wine. I have never tried it.

No. 7. *Brown*—Makes a grade red, light, but pleasant wine.

No. 8. *Louisiana*—Specific gravity of must, 95 to 105. Makes an excellent pale red wine, one of the best of this class, very heavy, with delightful aroma.

No. 9. *Rulander*—Said to make a very fine wine, resembling Hock.

No. 10. *Lenoir*—Specific gravity of must, 95 to 105. A fine, brilliant red wine, of great body and Madeira flavor.

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Here we have a list of eighteen varieties, which all, with the exception of one, may be classed as *fair*, *good*, and *very good*. Truly a glorious beginning for the short time, during which grape growing has been followed in this country, and I do not think I assert too much, in saying that this country will, after the space of fifty years, produce more and better wines generally, than the whole European continent. Our wines comprise already nearly all classes, from the white wines, with delicate bouquet, to the heavy claret and port; and it will not be long before also the true *sweet* or *Liquor wines* will be produced. I have myself made and tasted of some, that deserve that name. We will therefore soon be able to please the palates even of the ladies.

Here let me add a few words about mixing the juice of several varieties of grapes. This art, which is practiced to such an extent in Europe, has as yet been too little tried and practiced here. We have a great many varieties of grapes, the wine of which would no doubt, be improved by mixing with other varieties. Let us take, as an example, the Concord and the Norton's Virginia. The first has abundant juice, the last has great body, very much coloring matter, and is hard to press, at least many ingredients remain in the skins, which, if the mere liquid juice of the Concord is added, would be drawn out, and its natural harshness and astringency somewhat modified. I have tasted wine made from one half of Concord juice, and one half Norton's Virginia, fermented together, which pleases my taste more than the pure wine made of either of the two. The same may be said of the Herbemont and Norton's Virginia. Each makes a good wine by itself, but by mixing the two, not alone will the quality be increased, but each has some quality which the other wants, and will therefore make a better wine, at least more palatable to some persons, than by itself. It is, if I may so express myself, a hybridizing of wine in the casks, from which as good results may be realized as by hybridizing the plants, and with more certainty.

Many may expect of me that I should also speak here of blackberry, currant, gooseberry, raspberry, rhubarb, and even parsnip wine; but they will please excuse me, as I do not call them wine. They are made by adding water and sugar to the juice of the different fruits, aye, even spirits, and differ entirely in this from true wine, *i. e.*, pure grape juice, without any addition whatever, fermented as described before. They may be a very good drink for those who like them, but please do not ask me to call them wine. It would be an injustice to the juice of the noble grape, which stands on its own merits, to compare it with such manufactures.

In conclusion, let me say a few words about the use and abuse of wine. I might attempt its praise, did I think it needed it; but good wine, like all really good things, praises itself. From the remotest ages, wine has been in constant use, as a remedy in diseases, as the promoter of social hilarity; poets have sung its praises, the brave, the

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good, and the fair have enjoyed it; many a sad heart has it cheered, many a dull eye has it caused to sparkle, and to the feeble on the sick-bed it has been called the *bringer of joy*, truly a glorious office in this sad world.

But there are a class of people, who may be very worthy people, too, who call themselves sons of temperance, who lift their hands in holy horror whenever they hear of the use of any spirituous drink, and who are also strongly against the drinking of wine. They also generally profess to be Christians, and say it is against the Scriptures to drink wine. Now, I sometimes read the Good Book, too, although I confess, not half as often as I ought; and I have yet to find the first word in it against the moderate use of wine, but many, aye, very many, in its praise; and truly, if our Saviour himself changed water into wine, to promote innocent mirth among the guests at the wedding of Cana, it is enough to convince me that it cannot be wrong to use it moderately. Human nature needs a stimulant sometimes in this rough battle of life; and let temperance lecturers say what they please, they will remain in use; why should we not try to furnish the most innocent of them, *light, pure wine*, instead of the poisonous whisky and brandy now so generally used? I am a temperance man myself. I despise drunkenness as much as any one can; for that very reason, however, because I wish to see us a temperate and sober people, do I advocate the cause of pure wine. It is a well-known fact, that those European nations where wine is a common drink among all classes, are also the most sober, and that cases of intoxication are seldom heard of; they are also the most lively and merry; the common laborers of France, the Rhine and Neckar go about their work singing and rejoicing, and oftener reach a green old age than anywhere else. These are plain facts, and can be corroborated by abundant testimony.

Therefore, my friends, let us plant grapes, make wine, aye and drink it too, and cause others to drink it; with moderation, of course; and take my word for it, each and every one of us will become a true son of temperance and thereby please God, all truly good men, and also ourselves. Let us live and be happy while we may.

BIOGRAPHY OF DR. JOHN A. KENNICOTT.

By Charles D. Bragdon.

Charles D. Bragdon, having been appointed by the Society to prepare a Biography of Dr. Kennicott, for publication in the Transactions of the Society, and read the same before the Society at its late annual meeting, submitted the following, introducing the same with the following preliminary remarks:

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Mr. President, and Gentlemen of the Illinois State Horticultural Society:

I cannot write nor read to you from this paper the record of the life of Dr. John A. Kennicott, as I have been repeatedly announced by the Committee on Programme to do. He has written his own record—you know better than I can tell you, how and where. In your own hearts, affections, motives, inspirations, aspirations, likes, dislikes, taste, occupations, pursuits, enjoyment and characters, cannot you who have known and loved him, find some evidence of his influence in life—of his handwriting, whereby he has recorded it! And you are accustomed to read the record of men's lives as they are written on our prairies, by the planting of groves and belts of trees, orchards, hedges, shrubs and flowers, by the adornment of bowers, the consecration of home to the highest and purest enjoyments, the investing it with charms of unaffected courtesy and unostentatious hospitality,—cannot you find written throughout our fair State and the Great West, in these characters, the evidence that the life Dr. Kennicott lived, was not in vain—the written records of his life? It is not my aim nor my province to eulogize. I do not think I am noted at all for fulsome praise of men of any degree, condition or office—for writing what I do not believe to be true and just. Hence I trust that whatever of eulogy may be found incorporated in this biographical notice, will be received simply as a testimonial, from one whom he honored with true friendship, to the purity and usefulness of his life, and to the inherent nobility of his character.

Dr. John A. Kennicott was born in Montgomery county, New York, about 1800; the family records disagree. He was the eldest of fourteen children, and was known in the West as, and called in the family, "the Old Doctor;" so called because of the fact that there were several members of the profession in the family. With his father's family he removed from Montgomery county, successively, to Onondaga, Ontario and Cattaraugus counties, in that State. His early life was spent on a farm and in a small nursery, with his father, until about 1823, when he left the farm and went to Buffalo, N. Y., where he taught a school, served as a clerk in a drug store, and studied medicine—spending his winters, meantime, at the Medical College at Fairfield, Herkimer county. While attending college he delivered a course of botanical lectures in Buffalo, which were quite successful. After graduating, he lectured and wrote for the Buffalo press, practiced medicine on the Welland Canal, Canada, pursuing his botanical studies. About 1828, he left Buffalo and vicinity, and visited Detroit, Sandusky, Columbus, Cincinnati, Louisville and Natchez, spending some time at each of these places and in their vicinity, botanizing, &c. From Natchez he went to Jackson, Miss., where he lectured and practiced medicine one summer. Thence he went to New Orleans, where he became well known and popular as a teacher, lecturer, writer and editor. Here he started and published and edited the first literary, scientific and religious paper ever printed in New Orleans—the Louisiana Recorder. Associated with him, as writers, were some of the most accomplished literary characters of that period, in the South. But his career here as an editor and writer was incidental only to his labors as a teacher and lecturer. He was principal, for six years, of the Upper Primary School, Old Fauxbourg, St. Mary, New Orleans. He left this school to take charge of the Male Orphan Asylum. He had charge of this institution about one year before removing to Illinois. In March, 1836, he removed to "The Grove," where the last twenty-seven years of his life have been spent, where he died, and where rest his remains, in the midst of the beautiful farms he planted, and cultivated, and created.

Such, in brief, is the history of Dr. Kennicott to 1836. His first work after arriving in Illinois, after providing a rude shelter for his wife and child, was the planting of fruit trees and flowering shrubs and plants about his home, and the creation of a private nursery, with which to supply his own wants and those of his neighbors. His early education and cultivated tastes, made such surroundings a necessity to him; and his first work was an index of his passion for and love of all the beautiful things which God has created for man's enjoyment. During the earlier years of life in this State, he practiced medicine, riding an extended circuit among the settlers on the sparsely settled prairies.

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the title of the American Pomological Congress. At the time when this union was consummated in Cincinnati in 1851, Dr. K. was elected Chairman in the preliminary organization, and first Vice President of the permanent organization. He was also active in the organization of the Northwestern Fruit Growers' Association, of which he was presiding officer one or two terms. He has served the Illinois State Horticultural Society as its President, and his public labors were nominally closed when he retired from this position in December, 1861, delivering his valedictory, which he called "a parting legacy to the Horticulturists and Agriculturists of the West." He was also connected with and active as a member of the United States Agricultural Society, and did much to redeem it from the disrepute into which it fell. But it received little sympathy or support from him after the fair of 1853, in Chicago, to the success of which he so zealously and laboriously contributed. He was then brought in contact with the animating motives of those who controlled it, and discovered that his motives and theirs by no means ran parallel.

Dr. Kennicott was also a member and officer of several minor local organizations of a similar character. His hand, head and heart were always ready to co-operate in any work calculated to lift up the cultivator of the soil, and teach him and all others to honor and love all created things and their Creator.

Few men have done, said or written more than Dr. Kennicott, to secure the establishment of an Agricultural Bureau by the General Government. On this subject, his views, at length, have been repeatedly given the public. He was especially active to secure the recognition of Agriculture about the time of the election of Gen. Zachary Taylor to the Presidency of the United States. And he has often told me that President Taylor was fully committed to the scheme, and that it would have been successful had the General lived.

About this time, when there was a prospect that such a Department would be organized, the friends of Dr. K., without his solicitation, united in commending him to the President as a suitable head for this Department. The Illinois Legislature, then in session, passed a resolution unanimously recommending his appointment to the position. Dr. John A. Warder, then editor of the *Western Horticultural Review*, in an editorial, said, after referring to the importance and magnitude of such a work, "I do not propose, however, to write an Essay upon Political Economy, which is a topic too extensive in its reach and bearing for my present space. My object is simply to direct the public attention to the claims of the West to a representation in this important department of our government. The Commissioner of Agriculture should be selected from this portion of the country; and instead of being a *politician*, he should be familiar with the state of Agricultural and Horticultural science amongst us. I know of no man so well qualified for this place as Dr. John A. Kennicott, of Northfield, Cook county, Illinois. He is the *very* man—unknown, perhaps, in politics, but familiar with the Agriculture of our great Valley." The next *Review* contained a letter from the late W. D. Brickle, of Philadelphia, formerly President of the American Pomological Society, saying in reference to the above recommendation, that it gave him unfeigned pleasure, and "I fully coincide with you in the opinion that Dr. John A. Kennicott, of Illinois, is the very man to be placed at the head of this department. Possessing, as he does, talents of the highest order, a vigorous intellect, a discerning and discriminating mind, a fund of Agricultural knowledge, and, indeed, every essential qualification, I most sincerely trust he may be selected to occupy a position so important to the farming interests of the country. Though I am not a Western man, but a citizen of a State on the Atlantic border, yet I am prepared, (knowing his entire fitness for the station,) to exert any influence I may possess in aiding to procure an appointment every way so desirable. Without an able and efficient Commissioner, an Agricultural Bureau would not be productive of those beneficial results which we all so ardently desire and anticipate. Under the superintendence of such a man as Dr. K., the value and importance of this Bureau would fully realize the most sanguine expectations of its advocates."

These are only two of the many complimentary and emphatic indorsements of Dr. K., found in contemporaneous agricultural and horticultural periodicals—indicative of the interest he felt and the influence he exerted in the establishment of this Bureau. And latterly he made no little effort to *redeem* this department from the disgraceful position into which it has fallen, through the schemings of politicians, who live by preying upon the vitality of the people.

Dr. Kennicott was a zealous friend of Industrial Education. On this subject he has written much and well. He has importuned individual members and legislative bodies to

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him by his genial confidences, his sympathy and his hospitality. He entered into all their plans and pleasures with a zest which won their hearts. His spirit was young, and he, more than any man whom I have ever known, appreciated and loved young men. His home was their home; his knowledge and experience were funded for their benefit; his perceptions and judgment aided theirs in determining the direction their lives should take. While he loved his own children passionately, and his first and last thought was for their happiness and prosperity, he loved the stranger child scarcely less, and took equal interest in promoting his or her welfare. He always found time to talk to and correspond with young men. He understood and overlooked the errors in judgment, and the indiscretions of youth, and was careful not to lose his influence by pointing out and magnifying their follies and mistakes, but commended the good he saw, and fostered and cherished the higher natures of all with whom he came in contact.

Dr. Kennicott was a Christian philosopher. While he had identified himself with no church organization, still he gave evidence enough, to those who knew him best, of a devout heart; and he lived a life worthy the emulation of all. The key to his religion I recently found in an article of his, published about the year 1851. It corresponds so nearly with what he has so often said to me, that I desire to record it here.

Writing to an old friend and editor, who had but recently started a periodical devoted to horticulture, he said: "Would that I were capable of aiding you, as I wish, in the great work. But though a tolerable thinker, and much given to observation, I am no writer. Not that I have not written *much*, but that I cannot write *well*. And yet I love to write on all subjects connected with the cultivation of the earth; and as the spring melts into the summer, my season of hibernation will close, and if you will promise me to be as candid as Gil Blas, you shall, perhaps, have as many quids of my rambling, incoherent rhapsodies, as you will read.

"I love flowers and fruit, the graceful tree and half sentient plant, nearly as I love my children; and I am very apt to love all who think as I do on these subjects; and what I think and feel, *I write*.

"God is Love, and He has made this principle the one upon which turns the pains and pleasures of existence. All of us who are human, are imbued with some love of the beautiful and some capacity for enjoyment. There is religion in the love of the voiceless productions of nature; there are words of promise written on every opening bud, and the older we grow, the more we learn of the capabilities of this beautiful earth, and the natural enjoyments which the Creator has placed within the reach of every man who owns or rents a rood of ground—the more grateful are we for life and all its present blessings and future hopes."

He loved nature; and listening to the voice of God in nature, he loved the Creator of all things beautiful and good. I never knew a man more sensitive to the influence of the beautiful, whether in the tiny insect, the flower, the tree, or human form. God's works were not voiceless nor meaningless to him. He seemed to have an intuitive perception of the nature of plants. He was the friend of all ignored and uncultivated plants. He transferred them from the prairie and the grove to genial and suitable spots in his garden, where he nurtured them and taught his friends to admire his wild beauties. Many a flower, unnoticed on the prairie, has won exclamations of delight from the visitor, through such intervention.

But space and time would fail me to write all that is in my heart to say of the worthy life my father friend has lived, of the good he has done, of the influence he exerted and still exerts. I may sum it up thus:—He was a true friend; a pure patriot; a lover of his race and of everything good and beautiful and true; eminently social and affectionate; hospitable and self-sacrificing to a fault; unimpeachable in his integrity; progressive in all his impulses and acts; implacable in his opposition to wrong, and just in all his relations to men. As a writer, he was original, vigorous and emphatic. He always wrote as he *felt*, and thought; and thinking and feeling strongly, he wrote strongly. His articles always commanded attention. They were so invested with his individuality it could not be otherwise. And, indeed, there was a poetic element in them that attracted the reader. Dr. K. was a very industrious writer; and some of the best things he ever wrote are lost to the world, because he was his own most critical critic. His private correspondence was enormous; and no friend had cause to complain of inattention. But whether as correspondent or editor, his labors were faithfully directed to elevate and encourage, and benefit the race. And his works will live after him.

He died, as he had lived, and loved and worshipped, in his own house, in the midst of his garden, filled with the beautiful and eloquent objects he had planted, cultivated, and communed with as tokens of the Creator's love and benefaction. He died. Long

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EULOGY ON THE LATE DR. JOHN A. KENNICOTT.

By Arthur Bryant, of Princeton, Bureau County, Illinois.

Gentlemen of the State Horticultural Society:

By an arrangement made by a committee of your Society at its last meeting, a eulogy upon the late Dr. John A. Kennicott was appointed to be read on the present occasion. It may not be amiss here to say that the eulogy might, in the present instance, with propriety have been assigned to the same pen with the biography. Page upon page of empty panegyric may be a fitting tribute to the memory of the political demagogue—the titled or the wealthy, who living only for themselves, have passed an existence barren of results beneficial to the human race. But for those who have been active in enterprise, useful to mankind—who, gifted with the ability, and favored with the opportunity, have striven to make men wiser, better and happier, the best eulogy is the simple record of their actions. Such an one was Dr. Kennicott. To enter upon a particular detail of his usefulness would be a trespass on the department assigned to another; and the avoidance of this on the one hand, and a tiresome length of panegyric on the other, will necessarily render the present performance a brief one.

Although possessed of no mean skill in his profession, Dr. Kennicott became extensively known by his prominence in the horticultural, and to some extent the Agricultural enterprise of this State. His numerous essays on subjects connected with Horticulture were published principally in the Prairie Farmer, of which he for some time edited the Horticultural department; though many are to be found in other publications of the kind. In 1854, he edited with distinguished ability the first report of the ransactions of the Illinois State Agricultural Society, to which he made considerable contributions. His writings are characterized by ability, scientific knowledge and sound sense. Their style is easy—the language plain Anglo-Saxon, meaning precisely what it says, without descending to that turgid flowery mode of expression, with which some think it necessary to ornament their subject. A favorite topic for discussion, and an object to which he labored most assiduously to direct the attention of the public as well as the State and National government, was the better education of our agricultural population.

He was the first president of the Northwestern Fruit Growers' Association, and by his activity and influence contributed largely to the prosperity and usefulness of that society; the first of the kind ever established in the Northwest.

As President of the Illinois Horticultural Society he exerted himself to extend its influence, and promote its usefulness. The name of Kennicott will live in the annals of Horticulture as one of the earliest and most efficient promoters of its science in this section of the Union.

In the grand crisis of our national affairs, through which we have for three years been passing, Dr. Kennicott took the stand naturally to be expected from a true lover of freedom and of his country. His was not the mind which could sacrifice patriotism to party spirit, or the welfare—probably the very existence—of his country to the fancied sanctity of an enormous and deeply rooted evil. Although for years a resident of a Southern State, he never became an admirer of the "peculiar institution" of the South; that relic of ancient barbarism, which, followed by the curse of God since the earliest records of time, and tending inevitably to despotism, has shown itself powerful enough to inaugurate the most gigantic civil war the world ever saw, to deluge the land in blood and imperil the national existence. Dr. Kennicott advocated as the true policy of government, an energetic prosecution of the war, and a thorough crushing of the rebellion by any means best suited to that purpose. Nor did his patriotism expend itself in mere words. When one of his sons raised a company for the war, he took an active interest in the enterprise, and kept open house for the volunteers while the company was filling up.

Nor are the private virtues and social qualities of our lamented friend less worthy of notice than his public conduct. Of genial temperament and winning deportment, he had many friends; and they were ever welcomed to his home, with frank and generous hospitality. In private dealings, as in public trust, his integrity was unimpeachable. His domestic virtues are attested by the manner in which he reared a large family, some of whose older members already do credit to the source from which they sprung.

We may apply to our friend the words of the poet:

"This youth was innocent; his riper age,
Marked with some act of goodness every day;
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"Peace to the just man's memory—let it grow
Greener with years and blossom through the flight
Of ages; let the mimic canvas show
His calm and benevolent features; let the light
Stream out his deeds of love, that shunned the sight
Of all but heaven; and, in the book of fame,
The glorious record of his virtues write,
And hold it up to men, and bid them claim
A palm like his, and catch from him the hallowed flame."

He had enemies—but who that takes a prominent and decided part in the perpetual warfare of truth with error—of good with evil—of knowledge with ignorance, has them not? He had faults, too; to say that is but to say that he was but human; yet how few of those whose faults are not greater than his, possess the tenth part of his active goodness!

Doubtless the effects of the evil as well as the good in the character of man remain after he has passed away from earth; but the influence of the latter broadens and deepens as it passes down the stream, while that of the former is dispersed and lost in the waste of futurity. Such is the law established by Omnipotent wisdom.

Had the reverse been the case, all good had long since perished from the earth, and evil reigned supreme. As it is the hope of the philanthropist is just that man will advance in wisdom, virtue and happiness through the ages of infinite futurity. He whose memory we commemorate despaired not of the ultimate influence of his exertions, but while life was spared and health permitted, labored for the benefit of the human race. Let us profit by his example.

"Lives of great men yet remind us,
We may make our lives sublime,
And departing, leave behind us
Footprints on the sands of time.
Footprints, which, perchance another,
Sailing o'er life's solemn main:—
Some forlorn, despairing brother
Seeing, may take heart again."

GREENHOUSES, AND THE PLANTS THEY CONTAIN.

By Edgar Sanders, of Chicago.

The object sought in building greenhouses is, or should be, the well-being of its inmates—not outside show at the expense of its utility. A house, be it never so fine in outside appearance, if it fail to answer the requirements it was built for, is a sorry figure in any grounds, and far better that a somewhat tame looking outside should be splendidly filled inside with the best grown plants. The season when a greenhouse is most wanted, is the winter. Our seasons then are very severe; hence, the lower the structure, the easier kept heated and in a fit state for the growth of plants. This fit state consists mostly in a readily kept humid atmosphere, with the proper degree of warmth, the particular kind of plants designed to be grown there require.

This degree of warmth is regulated by the purposes intended. For example, if only one house, it will most likely have a pretty general collection of plants, and a sort of compromise will have to

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plants as claim a home in the tropics, and can only live even, many of them at a night temperature of 50 deg., while, to keep in a growing state, requires from 60 deg. to 65 deg. in winter; and to have a humid atmosphere, while the plants of the greenhouse require only such a natural humidity as will arise from the soil and surfaces exposed to evaporation. About 45 deg. as a night temperature answers for the common greenhouses where no forcing is carried on, and here the evaporation is much less rapid than in a house kept to between 50 deg. and 60 deg.

By forcing, the gardener understands a heat that will bring along a given plant faster than its natural condition would do for it. For example, in a common greenhouse the Geraniums or Pelargoniums would flower naturally along in April. To hasten their time of flowering, he would have to give them extra heat. This is termed forcing, and in it is one of the nicest points of the gardener's skill, and more than anything will show the pretender from the real, skillful gardener. As in the matter of regular growth, nature finds most of the materials to work with, while in that of *forcing* it is all artificial, and requires a nicety in practice.

By this it will be seen there are many different kinds of plant structures, to the professional all plain enough, but to the masses little understood.

Out west, however, the greenhouse, in its simplest form is the most generally met with; old settled countries, where wealth is abundant, being the concomitants of the highest style of the art. But even the short space of six years that it has been our privilege o number one "out west," wonderful progress is visible, especially ear the larger towns, in this our favorite occupation. Nor do the owns happily monopolise all the good things. The country, too, growing horticulturally. The vegetables come first; then fruits; ow it is time for flowers.

As the common greenhouse is the most frequently met with, nd the most likely to be built first, we will confine what we do y to this part of the subject, leaving the further discussion of the ubject to another time.

Even the common greenhouse can again be subdivided. For xample, if only the finest examples of culture are wanted, a different rule must be carried out to that if flowers be the special object rather than the former. This, however, will, if carried out, ring the green houses more strictly into a forcing house, as flow-

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This, too, is quite an acquisition, and far better that having naked stages.

The plants to be met with in common green-houses may be divided into two classes—the hard wooded and the soft wooded or succulent plants. Of the former the Camelia, the Azalia, the Rose, and similar plants, will do for illustration; while for the soft may be mentioned Cinerarias, Geraniums, and similar plants. The hard wooded are mostly of a permanent nature, and take the place in the greenhouse that the shrubbery does in the open ground. Age, usually, makes this class the more valuable, while most of the latter are more or less of an annual growth, either dying down naturally, being cut down by the gardener, or are grown each year from seed. The hard wooded should be kept by themselves as much as possible, consistent with the beauty of arranging, as by so doing they may better be given separate treatment. All plants love to be near the glass; but it is highly important the succulent ones are so suited, the growth being far more satisfactory. Short jointed, stocky growth should be the aim. This *cannot* be obtained by having fast growing plants a long way from the light. Another reason why the wooded section should be together is, they do not require so powerful a heat, more particularly the Camelia, the principal plant of the greenhouse.

In watering, no general rules can be laid down, as plants in different stages of growth require different proportions. As a rule, however, when in active growth, or in the flowering period, they should be well supplied; when dormant, or the temperature of the house is kept low, but little is needed. The true succulents, as Cactus and the like, should be kept all but without water in winter, but not other plants. It is a safe practice to never let a plant of any sort flag for water, but choose the happy medium to supply just before that would take place. When water is applied, do not give in dribbles, but abundance to soak the whole mass of earth. If the drainage is right, all the superfluous water will soak away. Rain water is probably the best, but we never use it, as well water is easier got; but it is important that the water be somewhere near the temperature of the plants.

In soil, much stress is paid by some writers about such a quantity of this, that and the other. It is doubtful if they practice what they preach. If a naturally good loam can be obtained, the more turfy the better, with the addition of rotten manure, leaf mold and sand. Almost any plants may be grown in this mixture. Some may require or do better in more loam than others: but with

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you have a base to grow anything almost. It is all we used, except occasionally a quarter of leaf mold in place of the manure, and for sand the top spit of a sandy knoll from marshy ground.

The number of plants capable of greenhouse culture is very large, and have at one time or another been grown there. But for practical purposes, or those that stick to us, the number is far more limited. Those who want a single house nicely stocked with plants that will furnish flower or foliage, and stand rough treatment occasionally, had better not bother with too many kinds, especially dear, but not always best sorts. The following list contains the names of only those known and tried, and that are readily obtained of any florist:

Aloysa Citriodora or Lemon Verbena.
Amaryllis—Bulbous plants; easy grown; many kinds.
Azaleas—Fine showy winter flowering plants; many varieties; can be had in flower from January to May.
Bezonias—Mostly leafed plants and hot house; a few do well in the greenhouse, as B. Incarnate, B. Fuchsides and B, Sandersu.
Bouvardias—These like heat; they are then quite an acquisition; mostly scarlet flowers.
Calceolarias—Raised from seed each year.
Camelias—This is *the* plant of the greenhouse. At least a dozen good plants should be in every collection. There are many kinds. The following are good enough; Old Dbl. White, Candidissimum, Frimbriate, Imbricate, Sacco, Sarah Frost, Lady Humes' Blush, Henry Favre and Abbey Wilder.
Cinerarias—Usually raised each year from seed.
Coronilla Glauca—A fine old plant, with scented yellow flowers.
Cupheaplatycentra—The only kind worth growing.
Fuschias—Choose about a dozen good sorts, including the old Speciosa and Diadem de Flore, for winter flowering.
Linum Tigrinum—An old plant, but easily grown; with showy yellow flowers.
Lobelia—Pretty little blue flowers; fit for hanging basket.
Nerium (*Oleander*)—A well known plant.
Pelargoniums—Showy plants in early spring; commonly called Geraniums; at least a dozen kinds should be cultivated.
Salvias—Useful plants for bedding or the greenhouse.
Tropaelolum Loblianum—This is the best greenhouse climber for the winter. Never out of flower.
Veronica—One or two of these may find a place.
Viburum or Laurustine—well worthy of space.

Besides these there are many plants equally deserving a place; but the beginner had better add them as he goes along.

The foregoing are mainly to keep in pots all the season through. The common bedding plants, also, furnish flowers, and must be grown for the sake of planting out in the spring. Of these the Verbena stands king. Two dozen varieties may safely be grown.

Geraniums, mostly scarlet flowers; some white and pink; very useful, winter and summer; at least six kinds.
Heliotropes—Always in demand for the bouquet; do well summer or winter.
Petunias—Double and single; do not flower in winter much.
Lantanas—A few of these are very pretty; the older the plant the better it flowers.
Feverfew—This plant is always a favorite, with its numerous daisy like white flowers.
Gallardias—Flowers freely in summer.
Neirembergias—Very showy dwarf bedders; not near so often met with as they richly deserve.

It is not necessary to take up much room with the bedding plants, except to obtain flowers from them, as cuttings may be struck in the spring, which furnish plants plenty large enough for planting out in the end of May.

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GRAPE CULTURE.

By Dr. Jno. A. Warder, of Cincinnati, Ohio.

The subject of Grape Culture has attracted an unusual amount of the public attention within a few years. So much has been said and written about Grapes in this country that the topic would appear to have been worn thread-bare, if not indeed entirely exhausted by this time, so that an apology were almost necessary from any one who should undertake to present himself before such a pomologically intelligent body as this, with an Essay upon the Grape. Such apology is found in the fact that all horticulture is progressive, and further, in the fact that the doings and sayings of the Illinois Horticultural Society are looked for with increasing interest by thousands who cannot conveniently attend its sessions and partake in its deliberations, but who may thus be reached by its printed record, through which it becomes a valuable missionary agent, for the introduction and diffusion of the most valuable information throughout the borders of an extensive range of country.

The zeal of cultivators in this department of horticulture has been so great that we are annually presented with new varieties of grapes, that press their claims upon our attention, so that while our lists are perhaps needlessly increased, we have this advantage, connected with the inconvenience of numbers, that while varying tastes are suited, we shall find that some among the numerous varieties, will prove to be adapted to almost every variety of soil and climate in our extended country. Every farmer and every cottager, certainly every villager, should plant the vine, and every one may do so at a trifling expense, with a good prospect of harvesting a rich reward in luscious clusters of the noble grape, which will gratify his taste, elevate the sentiment and contribute to the healthfulness of himself and family.

Aspect.—The aspect of the vineyard is, by some persons, considered a matter of great importance. Southerly inclinations are generally preferred, but our observations in many vineyards induce the belief that this is a matter of comparatively little importance.

Soil.—Almost any soil, not absolutely barren, will produce some

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he had tried several sorts in whatever soil he may chance to occupy. Besides, for limited planting, he may make the soil what he pleases, so the proposition may be repeated, that every farmer, cottager and villager—every occupant of a rod of soil, should train one of these blessed gifts to the human race, that he may not only sit in the shade of his own vines, but that he may gather and enjoy the rich clusters of health-giving fruits, that they will be sure to afford him in bounteous profusion. The vine is well and truly selected as the emblem of fruitfulness, and its burden of rich fruit cannot fail to inspire sentiments of thankfulness toward the Bountiful Giver of all good gifts, so that vine planting becomes a moral engine to ennoble our race.

The Loess formation which is here so admirably presented at and about Alton, Illinois, upon the bluffs of this noble river, as well as along the Illinois, and upon some other tributaries of the Mississippi, appears to be admirably adapted to vine culture.

Preparation.—The preparation of the soil should be thorough. Trenching with the spade or mattock has been insisted on by most writers, and is very extensively practiced; but excepting where, from the nature of the surface, manual labor alone can be applied, this expensive process is no longer considered essential. On every precipitous hill-side, where the land has to be thrown into terraces, and supported by walls of masonry, or by sodded banks, or where the soil abounds in stones, so that the plow cannot be used, we must resort to the slower and more expensive implements of human labor. So, also, in preparing for a very few vines to be planted about our dwellings, we must resort to the spade. The vine station should then be very well prepared, by excavating a large hole for each vine, or a long, wide, deep trench for a row of them, as for an arbor; the inferior soil from below should be removed and replaced by the introduction of good surface soil, such as sods, road scrapings, earth from the headlands of some field, and a portion of well rotted manure and some bones. If these have been all well composted together, they are still better for preparing the station, but if such material be not at hand, use good surface soil, abounding in old sods.

On no account should we omit the perfect draining of such a station, for if it be underlaid by a tenacious sub-soil, it will become a well of stagnant water to destroy the roots of our vines, and the labor bestowed upon the preparation of the vine stations will be utterly nugatory. Draining is a sine-qua-non in the preparation of the soil for the grape, and if the whole ground be not drained, an outlet must be provided for all the superfluous water that might accumulate about the roots. In making the border for a row of vines we should take advantage of the natural inequalities of the surface, so as to have one end lower than the rest, and thus secure a very simple drainage. If no such natural advantage be offered, the sub-soil should be pierced, if possible, and if this be impracticable, we must

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resort to superficial planting, by raising the border above the general surface. Fortunately, however, we may find soils almost everywhere that are easily managed, and it is farthest from my thoughts to deter any one from planting a vine by introducing imaginary, but possible, difficulties. I desire only to impress the importance of having the work of preparation well done, knowing the great advantage that it will be to the vine and its products during the long period it is destined to yield amply remunerating crops. On the contrary, I would rather show how simple an affair the preparation of the soils for a vineyard may be under favorable circumstances. Wherever the land is level or but slightly rolling, the plow may be used to great advantage, and the result is even superior to that generally obtained by the use of the spade and mattock. The best implement is the double Michigan plow, drawn by a strong team, and followed by the sub-soil lifter. If oxen be used, the same team may be changed from one plow to the other, and at the end of each circuit, or each implement may have its own team and driver, where there is sufficient force at command. By these means the ground may easily be stirred fifteen or eighteen inches deep and left exposed to the frosts of winter. In the spring, the same treatment may be applied, but the plowing should be across the furrows first made, and the plowing should be deeper, so as to loosen the soil at least twenty inches. A third stirring, with the same implements, may be done before planting the vineyards, and the grounds will be in better condition and at less expense than if dug by hand labor.

I will here quote from my report to the Cincinnati Horticultural Society:

Preparation.—"The plow, followed by the subsoil lifter, has been found by Mr. Knox to be all sufficient for comminuting this soil. With a strong pair of horses to the plow, followed by two pairs of oxen to the lifter, he is able to work about one-third of an acre per diem. This process is performed in the autumn. The ground is next cross-plowed with the same implements, going deeper, and a third plowing is done in the spring before planting, so that the soil is thoroughly prepared, being stirred to a depth of from fifteen to eighteen inches.

"The vines are of one summer's growth from single eyes, that

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"The distance between the vines is six feet in rows that are eight feet apart; this is for trellis training upon the renewal system. A small stake is set by each plant, to which the shoots are tied. Instead of cutting the little vines back to two eyes, only the feeble wood at the ends is cut off, leaving several buds on the large plants, and as these grow, the weaker are rubbed out, and only the strongest allowed to remain. The reason for this is obvious—it is to insure against accidental injury to the prominent buds in handling plants. During the summer the shoots are tied to the stakes, and the next spring they are cut back to two eyes to force out two strong canes, which are tied up and trimmed of their laterals for three or four feet. In strong vines, a third cane is sometimes allowed to grow the second season, the object of which will appear presently.

"Training on the trellis commences with the third season of the vineyard, when the stakes are dispensed with. Posts are planted in the rows that run north and south, about sixteen feet apart; to these, strips of boards, three or four inches wide, are nailed, a foot from the ground, and seven feet above it; these are the rails to which the upright strips, about an inch square and eight feet long, are nailed. These are placed nine inches apart, from center to center. The vines are trimmed this spring so as to form the two arms, each three feet long, from which the fruiting canes are to be produced. In a very strong vine, that had been allowed to produce three canes the previous summer, the third shoot is trimmed to three or four feet for fruiting, and tied upright to the trellis bar, nearest to the vine stock, while the arms are secured to the lower part of the trellis. As the buds on these last break, they are thinned out by rubbing off a portion, so that only the strongest are left, and these are so arranged that one of them can be trained to each of the upright trellis bars, or one to every nine inches; that is four to each arm, eight to each vine. This we should think a tremendous amount of wood for the third summer, but with the soil and treatment to which they are subjected, many of the varieties of grapes require assiduous labor to confine them to this number of shoots, which reach the top of the trellis, and most of the canes bear a good deal of fruit. Mr. Knox feels confident that his Concord vines will average ten lbs. of grapes the third season. Some other varieties, such as the Taylor or Bullitt, and Herbemont, grow as vigorously, reaching the top of the trellis, and then stretching along horizontally for some distance; but some kinds do not cover the trellis the first year it is set up. These canes, produced from the arms are divested of their laterals during the summer.

"*The renewal system* of trimming is adopted in these trellises, with some modifications, by adopting the spur-pruning when necessary, as will be indicated below. In the fourth season from planting and always afterward, every alternate cane is cut back

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to two eyes, while the other is shortened, according to its strength, and tied vertically to the trellis for fruiting; the spur produces a new cane, so that one spur produces fruit and the other produces wood. If it happened that the cane of last year was not strong enough for the fruiting, it is cut back, and that which bore the previous year has its fruit bearing laterals trimmed to spurs for fruiting, in its stead. In this way, by judicious management, the whole trellis is kept covered with fruit from year to year, and the amount produced is really astonishing. As an instance, I may cite twelve Hartford Prolific vines, which are four or five years old, that produced 620 lbs. of fruit this year, from which $125 was realized. Apply this to an acre, which supports about 1,000 vines, as planted six feet by eight, and we may calculate the proportionate yield at fifty thousand lbs. of fruit. This, at the low price of five cents per pound, would produce $2,500 per acre! an incredible yield, and one justifying a large outlay in assiduous care and labor.

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"But to return to the grapes, the object of more immediate interest at this season of the year. You will expect to hear something of their appearance, and of the varieties in cultivation. In the first place the vines presented an aspect of perfect health and vigor; excepting a slight injury from hail, they seemed to have enjoyed complete immunity from all the ills that vines are heirs to—no insect depredations, no mildew on the foliage or canes, no rot on the fruit, which was perfect, except in a few instances where they had suffered from over-production, and that was only apparent in a deficient coloring. Though the neighborhood had been visited by some severe frosts, the foliage was still beautifully green and abundant upon some trellises, and ripening into rich tints of yellow upon others, with a slight frost scorching on the *Isabellas*, and only the foreign varieties, and some of the very earliest ripening sorts of the natives, had cast their leaves and looked bare on the 20th of October.

"I propose to transcribe a few of the remarks made upon my note papers while passing over the grounds, among the vines, but shall not describe all the kinds in cultivation. The first varieties planted were of the *Isabella* and *Catawba*, the kinds then generally cultivated. Both of these are bearing abundantly, the former heavily laden, but not at all the richer for its treatment here, being, as in other places, flat and insipid in comparison with other sorts.

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abundant, and though the flavor be somewhat musky, not to say foxy, or as some salesmen express it, of certain varieties, "with a characteristic native aroma," still it is the favorite with the people, and is selling freely at double the price of the Isabellas and Catawbas offered in the markets. Indeed, for general planting at every man's door-stone throughout the country, this hardy, vigorous and productive variety, apparently free from all the ills of grape vines, has the highest claims to universal favor. Still, some of us may be allowed to have our preferences for a table grape. For wine, the Concord has begun to assert its claims, and a few samples have already been presented to the connoisseurs, who have pronounced it a promising red wine. A good deal of it has been made at Hermann, Missouri, and Mr. Husmann writes me that the must weighs from 85 to 90.

"Next is the *Diana*, which is vigorous and productive, the bunch compact, the berry of beautiful color, tough skin, and rather firm pulp, juice sweet, and having a peculiar flavor, which has been called "feline." The thickness of the skin enables this grape to be kept a long time, so as to be on sale in the Christmas holidays, when it commands a high price. The wine from this grape is very highly flavored with the aforesaid "feline," and though peculiar, and at first, perhaps, repulsive, it strangely grows on one's affections. It will be valuable for mingling with the juice of some other grapes of less decided character—the *Delaware* itself has been suggested as one that might borrow piquancy from the *Diana*.

"The *Delaware* has succeeded admirably in this vineyard, where it has been extensively grown, and with such success as to induce much further planting. Whatever complaints may be made of this variety elsewhere, and some of us have had our trouble with the slender little things for which we have paid our money, this vine appears to find congenial soil upon the coal measures of the Monongahela hills. Three year old plants have made a splendid growth of firm, close-jointed wood, and in many cases the vines have completely covered the trellis, and run along on the top—several shoots were seen at least twelve feet in length, and in most cases there were more than the regular apportionment of eight canes to the vine, as well as an abundant crop of fruit. This grape has attracted so much attention of late years, and is so familiar to the horticulturists of our country that it is not worth while to describe its beautiful clusters of transparent, rosy berries, thickly spread along the vines. The wine is attracting great attention, and five dollars per gallon has been refused for that made by Mr. Mottier, near our city, who has had perfect success in growing this grape here. The weight of the must with him, in September, was 102. Mr. Werk's (probably the first run,) weighed 108. The wine sells at $24 per box or dozen. The vines, once established, bear most abundantly, and the luscious fruit is only too sweet for most palates, as a table grape, and to be eaten as honey rather than as food. The fruit sells at Pittsburg for 50 cents a pound.

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"The *Union Village* is also quite a successful grape with Mr. Knox. On account of its great size and fair quality, it commands a high price, bringing fifty cents a pound. The vine is vigorous and productive, but the fruit is too much like the Isabella to give much encouragement to wine-growers. It is essentially an amateur and market fruit. The excessive growth of the canes on this vine renders it somewhat tender, but I did not hear any complaints in this regard, where the growth is diffused upon the trellis, as the canes are not then so rank.

"The *Herbemont* shows all its vigor and greenness of foliage even at this late day, making a perfect screen of the trellis, and the numerous large clusters, thickly packed with the delicious, vinous, dark colored berries, were almost concealed from view. The vine is somewhat tender, and the canes, like those of the Diana, are taken down and covered with earth in the winter, but the fruit is so spicy and so free from pulp, that it is fully appreciated by the proprietor, who rates it among the best table grapes. Its qualities for wine are well known here. The must this year weighs 101.

"The *Elsinboro*, an old variety, but not generally cultivated, is a prime favorite with Mr. Knox, on account of its hardiness, productiveness and the rich sweetness of its small, dark-blue berries, with red juice. The bunches are rather large, loose and shouldered. The grape is desirable for table and for wine.

"The *Hartford Prolific* is an early variety, ripening its fruit for market early in September. The vine is hardy, vigorous and very productive, yielding more than fifty pounds at four years. The fruit is not first rate, but very desirable for market. The berries do not drop, as reported heretofore.

"The *Creveling* is winning favor wherever known. The vine is vigorous, hardy and promises to be productive. The bark and leaf-stalks are very red; the foliage is smooth, the angles pointed, deeply lobed and healthy. The bunch is loose, the berries rather large and blue, soft and melting, rather sweet; a fine market variety; ripening at Pittsburg, August 24, it makes a fine market fruit.

"The *To Kalon* is moderately vigorous, but does not appear to be very productive. The foliage is good, healthy, angular, pointed and pubescent. The bunches are not large, loose, and the berries are rather large, blue, soft and melting. They hold tenaciously to the branch, which makes this grape desirable for late use. It is sweet and musky; quality from good to better; a table grape Though well favored enough, it can scarcely be said to justify its cognomen, which means, emphatically, *The Beautiful.*

"The *Blackstone* and *Louisa* are evidently seedlings of the Isabella, which they resemble in so many particulars that their identity with the latter might well be suspected.

"The *Opporto* is sufficiently vigorous and healthy, tolerably productive, but the bunches are not large. It may make a good red wine, but it is not desirable for table. The same remarks will apply

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to the *Boggs' Island*, which has smaller bunches, and medium sized, dark blue berries, with a peculiar astringency; indeed, it resembles our *Worthington* grape in its slender wood, and thin, smooth foliage. The fruit of Boggs' Island also colors early, but is not ripe until it has been frosted.

"The *Alvey* is only moderately vigorous, rather slender, and does not appear to ripen its wood perfectly; the foliage is rather small and persistent; the bunches are small, loose and shouldered, with small, round, blue berries, that are soft and juicy, with a brisk acid flavor, promising well for wine; it ripens from September 15th to the middle of October.

"The *Canby's August*, probably the Royal Madeira, has vigorous, hardy, brown wood, with good, roundish leaves somewhat pubescent. The bunches are small and loose, bearing round, blue berries of medium size, which are sub acid and of indifferent quality. This is only a market fruit, ripening the end of August.

"The *August Pioneer* is a *very fox* grape, having vigorous, red, pubescent wood, with round and very pubescent leaves. The bunches are small and loose, with large blue berries, that are very pulpy, round and dry, sweet and foxy, indifferent and fit for market only, ripening August 20.

"The *Mary Ann* is of similar quality, having vigorous brown canes, furnished with healthy, roundish and very pubescent leaves. The bunches are rather small and loose, with large, very oblong berries, that are very firm and pulpy, as well as very musky and of poor quality, ripening early in September. These grapes are unworthy of cultivation, and may be classed with the native *Amber*, *Northern Muscadine*, *Charter Oak*, *Wild Fox*, *et id omne genus*.

"Since there is a great desire with the public, and especially with amateurs, for white or light colored grapes, they may now be gratified by cultivating several varieties of this character.

"The *Taylor* or *Bullitt* is one of the most promising of this class. The wood is very vigorous, but slender, and of a pale brown color, with some bloom; the joints are rather long, but the canes exceeded the hight of the trellis. The foliage is good, angular, serrated and smooth. The bunches upon these young, thriftily growing vines were small and compact, crowded with rather small, green, amber colored, red and dull red berries, which are melting and juicy, slightly pulpy, mild sub-acid to rich sweet; a very good table grape, ripening September 20.

"The *Anna* is but moderately vigorous in its canes, but they are firm; the foliage is small, pubescent, and disposed to curl and fall. The bunches are scarcely medium and rather close; the berries are from medium to large, round, of a whitish amber color, covered with a thick, white bloom; they are juicy, sweet, aromatic, but the skin is thick and the pulp firm. This is only an amateur variety, ripening the end of September.

"The *Rebecca* and *Cuyahoga* have higher claims for our praise,

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being more refined and delicate. Both of these are desirable amateur varieties, the former rather bearing the palm of excellence in the opinion of most judges.

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"TROY HILL—CATAWBA VINEYARD.—No one who loves a vineyard, and who can appreciate the invigorating effect of an elevated situation, commanding extensive views of interesting objects, scattered over hills and valleys, embracing the noble rivers, extensive forests, and a great city, with its thousand evidences of the busy throng of bustling industry, should fail to visit Troy Hill, in Reserve township, immediately north of Allegheny City, where may be found nearly one hundred acres of vineyards. These are chiefly planted with Catawba vines, set closely and trained to stakes, in the German method.

"The thrift of the Teutons, and their untiring industry, is here everywhere displayed. The vineyards are often situated upon the most bold exposures and declivitous descents, where the culture must be performed wholly by human labor. Some of the soil appears to be nearly all stones, and yet the vines are thrifty and productive. The road leading to the ascent is cut in the face of an almost perpendicular cliff, and the wall that supports it seems to spring directly from the vineyards many feet below.

"One of the pioneers, an enthusiastic vine planter, Mr. Adam Reineman, a successful merchant of Pittsburg, who takes his pleasure and pastime in his vineyard, and in ornamenting the grounds about his comfortable dwelling, where fruits of various kinds abound and thrive. His vineyard, though closely planted, is trimmed and trained with double bows, and is thus able to set a very large crop. Last year the produce of one acre and a quarter was 1,554 gallons of wine, made upon a press with only a two inch screw. Besides this, a second grade of wine was made from the marc, which is mixed with water and allowed to ferment, and then pressed, producing a light, rough wine, of inferior quality. A further evidence of what may be done in large yield may be given. Seven vine stocks trained long, on an arbor, produced this year twenty-eight gallons of wine—the quality I had not an opportunity of inspecting.

"In conclusion, allow me to reiterate the delight that was experienced in visiting these favorite vinelands. The success of others should give us pleasure, even where the contrast with our own less

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FRUITS AND THEIR ASSOCIATIONS.

By O. W. Hoyt, of the Home Nurseries, Augusta, Ill.

We should have an *object* in whatever we do, and use all our energy and power to develop that object. He that lives without an object has no force of character. Life would be a failure—worse than a blank, leaving no mark to identify its existence. The talent would be returned to the good master of the vineyard unimproved. You all know what the reward is for such. As the man that improves his own home improves the homes of all that surround him; so he that improves his mind will improve the minds of all those that come in contact with him. Each mind is a center of influence, for good or evil, in a degree according to its strength of powers. The current of influence runs so still and silently, and the mind of youth is so susceptible and confiding, that it is very necessary for the young man, just landing upon the ever-changing current of business-life, to have not only well established principles but *pure associations*. These are not to be found on the corners, in tobacco shops or drinking saloons, where thousands wreck all that is dear in life. Those are places to be avoided. The mercantile life is sadly mixed with iniquity and impure associations. So is every calling that man can turn his attention to. But there are some that have *less* of the impure connected with them than others. There are some that have more elevating influences connected with them, stronger incentives to refinement and cultivated taste, than others; have more avenues in which the mind can search for the beauties of creation, and prepare the spirit of man for a near approach to the Infinite. Oh! it is delightful to be in fields of fruits and flowers, where the sweet roses extend their friendship with no contaminating breath, and the lilly gladdens your heart without fear of betrayal. It is more than delightful—it is profitable. 'Tis there you may find pure associations, and feel the mind perceptibly drawn away from all that is gross and vulgar. And these enjoyments are *free* if you are but willing to put forth your hand for them. They spring spontaneous from the earth, and God has generously bestowed on each of us the elements of system and order, that we may create a harmonious arrangement of them, to suit our own individual taste. God created the first garden, and planted the first tree, and these are powerful auxiliaries by which to study the divine mind. I mean trees and plants in particular. Around the habitation of Adam, He planted the evergreen trees of life, and the tree that bore the fruit of knowledge. Thus we see trees, fruits, and their associations intimately connected with our origin, and linked with our intellectual and spiritual life. All the callings of man are only auxiliaries by which his mind is prepared for an association with the ruling intelligence of creation. The earliest record of history bears evidence of fruit being almost inseparably connected with the needs and wants of the human system. That there was a

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craving desire in the mortal body for fruit is plainly illustrated in the reaching forth of the hands of our first parents, after that which was then, as now, delicious to the taste; and they loved a variety, and their curiosity prompted them to taste of each kind, and in satisfying a morbid appetite—like many of their frail descendants—they got hold of some that proved to be bitter. As we follow the historian's pen down the march of ages, we find every nation advocates of fruit—in times of peace and in times of war—holding on, grasping the elements of its life, to save it amid the wreck of nations, that they might enjoy this luxury in their exile. Everywhere through the Bible we find fruit and its associations, and everywhere used for the most beautiful illustrations of life. We find it on the table of Kings and Princes, and the poorest cottager. It is one of God's richest temporal blessings. The meanest and the vilest, together with the most pure and good, have free access to its virtue.

The cultivation of fruit in the nineteenth century has assumed a great magnitude and importance, proving to be a great power in the land—a magnet around which centre the thoughts, energies and hopes of millions of men. This is decidedly a *living* age, though a shower of dead fall monthly. But we want men—*living men*—to keep pace with the times. Men do not look back on misfortune as did *Lot's* wife, and be turned into pillars of inactivity. If we take a retrospective view at all, it should be to hasten our steps in the improvement of the present, from the experience of the past. We have had organization in the past, but the volunteers in Agriculture and Horticulture have become so numerous, that they stand like a vast army that need re-organization. Every cause has its pioneers and missionaries—men educated and prepared to form the public mind for the reception of truths. And in re-organizing and making a forward movement, corresponding with the advanced state of intelligence, we find we need colleges, well manned with minds vividly practical, where sons and daughters of our land may be instructed in all the bearings that our common calling has on our intellectual faculties, and thus be elevated and brought forward to the advance of general knowledge. A college where the student can ingraft theory and practice, uniting and blending the elements of intellectual and physical strength which in time will yield its perfect fruit. "Philosophers and statesmen will thus spring up in the country pastures that will outlast the hosts of unoriginal men." Men that will be every way qualified to guide the State and protect the interests of the nation honestly. We need statesmen that have had their principles established, and their habits formed amid purer scenes and more temperate associations than the city affords. We trust the Agricultural Colleges will form men, who, while they enjoy the public trust and confidence, will not squander their time and talents in riotous living, and instead of the passionate, fiery past, we may have a temperate future, fruited with great blessings.

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ON TREES AND TREE PLANTING.

REPORT OF COMMITTEE.

To the Prairie Farmers of Illinois:

The undersigned were chosen by the Illinois State Horticultural Society, at its late meeting, to "prepare and distribute throughout the State a paper, setting forth the benefits of planting Forest Trees upon our prairies, and giving plain directions for their propagation and cultivation.

The instincts, as well as the education of civilized man lead him to procure such conveniences as will give him the most comfort for a given amount of labor or money. In the settlement of a new country, he is often obliged to take up with such means as are nearest at hand, however inconvenient they may be. Timber has always been considered so absolutely indispensable, that its total absence would be completely fatal to the planting of colonies or the opening of farms. Hence the early emigrants to the great West settled along the streams skirted with timber, or nestled around the beautiful groves which here and there stand out upon these great prairies, as though to teach man a lesson of wisdom, showing him how he may appropriate the resources of Nature, and secure for himself and his children, even upon the wide prairies, the same advantages which she has provided for him in these most favored spots. Alas, how few heed these teachings until avarice steps in and says—"Plant trees—they will bring wealth." Truly they will bring gold, and what is better, they will bring health and comfort.

We would appeal to you, therefore, in behalf of your own and your children's best interests, as well as the future prosperity of our own beloved State, that you consider the subject carefully, using all the means within your reach to prove either the truth or the fallacy of the statements contained in this circular. We have investigated this subject thoroughly; watching carefully the growth of many varieties of forest trees and their adaptability to prairie soils, collecting facts in relation to the various uses to which they may be applied; comparing our experience and observations with those of others, and herein present the result.

A few of the many ends to be gained by extensive planting of Forest Trees upon our prairies are—

I. The Promotion of Health.—It being a well-known fact in vegetable physiology that poisonous gases are absorbed by the leaves of trees, and thus converted from health destroying into health promoting elements.

II. Shelter from Violent Winds, and an absolute checking of their force to so great a degree as to preserve growing crops of cereals from destruction, and secure a large increase of fruit; also secure a more equal distribution of rain and snow over the surface of the ground.

III. Securing a Supply of Timber for fencing, building, fuel, and all mechanical purposes.

IV. Adorning our Prairies, rendering our homes attractive; in short, changing these nude and monotonous prairies into charming and varied landscapes.

Although these general results are readily admitted by those who have bestowed thought upon the subject, yet the real importance of the enterprise and the immense magnitude of its consequences, extending as they would far into the future history of our State, adding millions to its revenue, and blessing a long succession of generations yet unborn, are, we fear, seldom computed, if ever thought of.

We shall not, in this circular, attempt to consider at length all these branches of the subject, but content ourselves with giving a list of some of the most desirable trees suited to these ends, marking most important steps required in their successful cultivation.

We will consider, in the first place, the varieties adapted to planting in belts for windbreaks.

It is obvious that evergreen trees, or those which retain their foliage throughout the year, form the most perfect screens. By a wise provision of Nature, almost every variety of soil and situation in our State is well adapted to the growth of some of the varieties of evergreen trees. The following varieties will succeed in almost all locations, and with the cultivation which we shall describe, will make an average growth of about twenty inches per year, viz:—Norway Spruce, Red Cedar, American Arbor Vitæ, White, Scotch and American Pines. There are several other varieties which are hardy, and may be planted with profit, viz: Balsam Fir, our Native Spruces, Yellow and Gray Pines, and a few others. The Balsam especially grows rapidly, and has the darkest, richest foliage of any of the varieties named, retaining its color through winter, though since it is liable to lose its lower branches after the trees attain a hight of about forty feet, it is not so desirable to plant alone as the first named sorts; yet it may be mixed in with the Spruces and Pines with pleasing effect.

All the varieties of Evergreens are difficult of propagation from seeds, and can be purchased from those who make this their special business much more cheaply than the farmers can propagate them.

The Norway Spruce is doubtless one of the best, if not the very best, of trees for screens. It may be transplanted without a loss of one per cent., is perfectly hardy,

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grows rapidly, forming a dense pyramid or cone of evergreen foliage, one hundred feet high, with a base, when standing alone, of at least thirty feet in diameter. Trees of this variety, two and one-half feet high, can be purchased at twenty dollars per hundred. The ground should be prepared by trench plowing or subsoiling in the autumn, or deep plowing and thorough plowing in the spring. Early spring is the best time for planting all varieties of evergreens, though they may be removed with little loss at any time during the spring and summer months. If in the latter, a damp cloudy day should be selected for the work. In removing evergreens, pains should be taken to preserve as many of the roots as possible, without mutilating them, or splitting them at the collar. The roots should be dipped in mud (previously prepared) as soon as taken from the ground, and packed with damp straw or moss about them, being careful to prevent their exposure to the sun or dry air, for if the small roots are once allowed to get dry, the trees cannot be relied upon to survive.

In planting, pains should be taken to have a mellow bed for the roots, which should be spread out with the extremities lower than the collar, filling all the interstices with fine earth. Press the dirt moderately upon the roots, and cultivate thoroughly with the plow for the first four years; after which a thorough mulching of straw once in two years will be sufficient. Treated in this manner, not one tree in forty will die.

Trees of the Norway Spruce should be planted in rows, ten to fifteen feet apart, with trees the same distance in the rows, placing the trees in the second row opposite the spaces in the first. At these distances the branches will eventually interlock to a considerable hight, forming an almost impenetrable and beautiful wall of foliage, which will effectually check the fury of our most violent storms.

Trees of the Red Cedar and Arbor Vitæ can be procured at about ten dollars per hundred, and may be planted more closely if desired, though if closer than ten feet they will not attain their full size and strength as forest trees.

The Pines should not be planted closer than sixteen feet, as they grow into broad majestic trees. A better plan would be to plant the rows twenty feet apart, placing the trees ten feet apart in the rows; and when grown so as to interfere, cut out each alternate tree, leaving the trees standing in the positions named.

Deciduous Trees for Belts.—There are many varieties of deciduous trees readily produced and easily grown, which are valuable for screens, each of which possesses some merit not found in the others.

The most rapid growing varieties are the Yellow and White Willow, White and Ash-leaf Maple and Lombardy Poplar.* These will grow from four to six feet in a season, and, therefore, will compensate for their cost in a few years from planting. All these varieties may be grown from cuttings, though, as the Maples do not strike readily, it is more profitable to propagate from seeds.

The Red and White Elm, White and Blue Ash, White, Yellow and Black Birch, Scotch and American Larch, Black and White Walnuts, are all very desirable trees for planting, both in screens and groves.† Screens of deciduous trees should consist of not less than three rows, planted and cultivated as above directed. Corn or potatoes may be planted among the trees the first two years.

The *Yellow* and *White* Willows are unquestionably the *most* available and desirable among the fast growing deciduous trees. They grow readily from cuttings and combine rapidity of growth with perfect hardiness in all situations, whether high or low. They have a dense habit of growth, which peculiarly fits them for breaking the force of the winds.

As all the varieties of deciduous trees named are much more cheaply grown than the evergreens, a screen of three rows would cost no more than two rows of evergreens. And it may be positively demonstrated by any person having a correct data upon which to base his estimates, that an investment in *any* of the varieties mentioned, would be as profitable as the same amount loaned at twenty-five per cent. per annum.

We may add materially to these profits by planting such sorts of trees as will subserve other purposes at the same time, without detracting from their service as a wind-break. Thus, the White and Black Walnuts and the Chestnut will afford the luxury of their fruit; also by planting *six rows* of White Willow it will grow in ten years of sufficient size for fence posts, rails and fuel, and by judicious management in cutting these, a constant supply of timber can be procured and still leave three of the rows well grown for a screen. This variety grows readily from the stump, so that a succession of crops may be taken from the same ground without replanting.

The Ash-Leaf Maple (*acer negundo*) a valuable tree for protection, making an average growth of about four feet per year, and forming a beautiful, compact head, is also very rich

*The American Linden or "Basswood" is also a very fast growing tree, ripening its seeds in the autumn. It is said to bear planting well and proves profitable for extensive planting, but we have not ourselves propagated or cultivated it.

†The State Horticultural Society at its last meeting added the Chestnut to the above list, yet we fear it is not sufficiently tested on the flat prairies to warrant extensive planting in such situations. We know it grows rapidly, and is perfectly hardy on rolling or undrained lands.

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in saccharine sap, which makes an abundance of light colored, well grained sugar, almost *identical in flavor with that made of the hard maple.*

The testimony upon these points is unanimous and perfectly conclusive. Every farmer upon the prairies having a belt or orchard of these trees, must regard it as one of the most profitable parts of his farm, since he is comparatively at leisure during the sugar making season, and can provide, at a trifling expense, a full supply of excellent sugar for his family use. Trees designed for sugar making should be planted not less than sixteen feet apart. If cultivated as before directed, they will be large enough for tapping in six or seven years. This tree is indigenous to various parts of our State, and the seeds can be readily procured. Like the Ash, it ripens its seeds in the fall. They should be picked from the tree as soon as the foliage is destroyed by frost, and may be sown at once or kept in small bags or shallow boxes in the cellar for spring planting. About the first of March they should be mixed with damp moss, old sawdust or earth, to facilitate their germination—and should be sown as soon as they begin to sprout. Sow in mellow soil, in drills, a foot apart, and transplant the next spring to nursery rows, three and a half or four feet apart. Shorten in the tap roots and set the plants about a foot apart in the rows. In two or three years they will be ready for removal to the belt. Of course the ground between the rows should be often stirred and the young trees kept free from weeds. *

This mode of cultivation will answer for all the varieties grown from seed, except the nut-bearing trees. With these it is better to plant the nuts in the fall, and before they have become dry, where the trees are wanted to stand, or put them in damp earth and subject them to frost through the winter—planting carefully in spring as soon as they show any sprouts.

The White Maple and the Elms ripen their seeds in May, which should be sown very soon after they are gathered.

As the results of our observations, and from the testimony of reliable men, we regard the following as about the average growth, *in twelve years*, of the leading desirable varieties, when planted in belts or groves and *cultivated* as directed:

White Maple, one foot in diameter and thirty feet high.
Ash-Leaf Maple, one foot in diameter and twenty feet high.
White Willow, one and a half feet in diameter and forty feet high.
Yellow Willow, one and a half feet in diameter and thirty-five feet high.
Lombardy Poplar, ten inches in diameter and forty feet high.
Blue and White Ash, ten inches in diameter and twenty feet high.
Chestnut, ten inches in diameter and twenty feet high.
Black Walnut and Butternut, ten inches in diameter and twenty feet high.
Elm, ten inches in diameter and twenty feet high.
Hickory, eight inches in diameter and twenty-five feet high.
Birch, (varieties,) ten inches in diameter and twenty-five feet high.
Larch, eight inches in diameter and twenty-five feet high.

As before intimated, the different varieties of Evergreens mentioned will make an average growth of eighteen to twenty inches in hight annually.

From these and other data which the intelligent farmer can collect, he may readily make *approximate* estimates of the cost of fence posts, rails, firewood, hewing timber, lumber, etc. Our estimates, which we have made with great care, result about as follows, viz:

Fence posts, from the soft wooded, rapid growing trees, two or three cents each; lumber, six to seven dollars per thousand; firewood, one dollar and a half per cord.†

Ash lumber, one of the most useful varieties for mechanical purposes, will cost about ten dollars per M. Black Walnut about the same.

Posts of Black and White Walnut (Butternut), four cents each.

The slower growing and more enduring varieties should by no means be neglected, but should be interspersed in our groves with the more rapid growing sorts, arranging them so that the latter may be cut out and leave them evenly distributed for a more permanent forest. Of course, the lumber, etc., from these will be much more expensive than the former, yet an assortment of varieties is essential and almost indispensable, and a noble spirit of patriotism should stimulate us to plant these for the good of those who are to come after us.

The following fact in respect to the growth of some of these varieties has come under our observation:

Upon the farm at Riverside, Cook county, there are fifteen acres of land which twenty-five years ago had only a few old Oaks and Hickories scattered over it. This same land is, to-day, covered with a dense growth of straight timber, varying in size from the young shoot of two or three years growth to tall stems from sixteen to eighteen inches in diame-

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*Trees of this variety, also White Maple, Willow, Poplar, Ash, Linden and Elm, transplanted at one year, six to eight feet high, can be afforded by our nurserymen at about $6 per hundred.

†Those varieties of wood which grow the fastest and split are really the cheapest to grow for posts, since, if they do not naturally last well in the ground, they may be prepared by use of gas tar or by cyanizing at an expense of three cents each, so as to last from twenty to thirty years. We have reliable testimony, however, that seasoned posts of the White Willow will last from twelve to twenty years.

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ter. This change cost no other labor than that of protecting the ground from fires. The varieties are several sorts of Hickory, Elm, Ash and Cherry, with an undergrowth of Crab, Plum, Haw, Dogwood, etc.

This land furnishes the owner with fuel, and farm with fence and other timber, without deteriorating, and is worth more than sixty acres adjoining.

Of course these same varieties planted on well prepared land, at the proper distance and receiving good cultivation, would have been still larger.

A striking instance of the value of groves and belts in protecting growing crops was observed just previous to the wheat and oat harvests of 1862, in the northern part of the State, when a storm from the west prostrated nearly all the grain except where sheltered by the groves or protecting belts. In one instance, at Willow Creek, Lee county, a field of grain lying east of a line of White Willows stood erect and was harvested with the reaper, while that lying beyond this influence was prostrated. Nearly all these crops, throughout that region, were hooked up by the slow and laborious process of mowing, and did not yield more than one-half a crop. The grain lost in this single storm would have paid the expense of a belt of timber upon the west line of every cultivated eighty acre lot.

The scathing effect of the prairie winds upon our fruit trees are matters of common observation. How often do we hear the remark that "Orchards in and about groves produce annually good crops, while those out upon the open prairies seldom perfect more than half a crop." This results partly from the blossoms and fruit being wrenched from the trees by the fierce winds, and partly from the fact that a given degree of cold proves much more disastrous to fruit buds or blossoms when accompanied by wind than when the air is still. The trees, themselves, are the greatest sufferers. The first become leaned by the strong southwest winds, so that the rays of the sun from one to three o'clock fall almost vertically upon their naked trunks, which vitiates the sap upon this side, producing a strip of dead wood. This invites the borer and the aphides; the trees become permanently diseased and hasten to premature decay.

The increase of our fruit crops alone would also amply repay the cost of their protection by screens.

We have said that timber induces frequent showers. The clouds are attracted by many millions of leaf points, and will follow this attraction unless it is overpowered by strong air currents, hence a *distribution* of the *timber* must generally produce distribution of rain.

It is also a well established fact that bodies and belts of timber modify the climate to some extent. Our prairies are subject to the extremes of scorching heat in summer and intense cold in winter. But if one-tenth of the surface was covered with trees the air currents would be changed, the temperature would become more uniform, and we should no longer be subjected to those distressing extremes of heat and cold, drouths and storms, so painful to our senses and so often fatal to life.

Some of the European nations are now as assiduously engaged in replanting forests as their forefathers were in cutting them down. Even in the older settled portions of our country, once covered with immense forests, but now denuded, the inhabitants look with solicitude upon the climatic changes produced by the too general destruction of trees, in the drying up of springs and smaller streams, the more variable climate, greater tenderness of fruit and ornamental trees; and they are considering the necessity of replanting, to correct their error.

Some of the most delightful climates on the face of the earth have been seriously changed by the wholesale destruction of their forests, viz: the Cape de Verde Islands, Greece, Italy, Persia and Palestine, that land flowing with milk and honey. So also did the lovely climate of Ceylon, if recollection serves aright, suffer to such a degree from the destruction of its spice forests that the inhabitants were obliged to replant them in order to counteract the pernicious effects upon their health produced by their loss.

And let not any one think that because we have but little forest upon our great prairies that we can never suffer more than we do now. Most assuredly we will; we can see this from year to year. The country is getting drier and drier with each succeeding year, and many crops that we once raised successfully we can now scarcely raise at all.

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this matter;" that "the people will not listen;" "they are not ready for the subject;" "that it will take too long to grow the trees;" "they will not work for coming generations." But the people *are* agitating the subject. They are not only listening, but they are reading; nay, beginning to plant. All they want is guiding in the proper direction. The present generation *may* yet live to sit beneath the shade of their own forests. The assertion that prairie *soils* are unfavorable to the growth of forests or orchards is simply absurd; and when forests and timber belts are grown, the last stumbling block of *fruit growers* will have been removed, and we shall grow any fruit which our summer will mature. Let us, then, brother farmers, commence in earnest the work of checkering and dotting these naked prairies with belts and beautiful groves, and many of us will live to enjoy their genial influences, and our children will bless their fathers for thus providing for them a prolific source of wealth and comfort.

Copies of this Circular will be sent by either member of the committee on receipt of a two cent stamp.

JONATHAN PERIAM, Thornton Station, Ill.
H. D. EMERY, Chicago, Ill.
O. B. GALUSHA, Lisbon, Ill.
Committee for Illinois State Horticultural Society.

CHICAGO, ILLINOIS, *Jan.* 2, 1864.

REPORT OF CORRESPONDING SECRETARY, 1863.

I have, during the past year, issued a Fruit Circular, for the purpose of ascertaining what varieties of all kinds of fruits have been found best adapted to the various soils and climates of Illinois. About 450 circulars were sent into nearly every county in the State, and into some of the adjoining States. Answers were received to only about ten per cent. of the number sent out. Forty-one counties returned fifty answers, and three States sent one each. These, divided according to the Fruit Districts of the State, were as follows:

From the	31	counties of	Northern	Illinois,	16	replies from		15	counties.
"	33	"	" Central	"	18	"	"	14	"
"	38	"	" Southern	"	16	"	"	12	"
Total,	102				50			41	

From Missouri..... 1
" Indiana..... 1
" Ohio..... 1

Total answers received.....53

The following table will show the division into Fruit Districts, the counties rom which answers have been received, and the names of persons sending them. Northern Illinois comprises those counties, all or the most of whose territory lies orth of the Logansport, Peoria and Burlington Railroad. Central Illinois, hose counties all or the most of whose territory lies south of the above road, and orth of the Alton and Terre Haute Railroad. Southern Illinois, those counties ll or the most of whose territory lies south of the last named road.

Northern or Æthiopia.	*Central or Nubia.*	*Southern or Ægyptus.*
oone,	Adams—Clark Chatten, William Cutter.	Alexander,
ureau—V. Aldrich.		Bond—H. Howard.

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Northern or Æthiopia.

Livingston—N. Buck.
McHenry—E. S. Hayden.
Marshall,
Mercer—T. McWhorter.
Ogle,
Peoria,
Putnam,
Rock Island—A. S. Coe.
Stark,
Stephenson,
Whiteside—L. S. Pennington.
Will,
Winnebago,
Woodford.

Central or Nubia.

McLean—F. K. Phœnix, H. Schroeder.
McDonough—J. Cunningham.
Mason,
Macoupin—J. Huggins.
Mason,
Menard,
Morgan—J. B. Turner.
Moultrie,
Piatt,
Pike,
Sangamon,
Schuyler,
Scott,
Tazewell,
Vermilion—James Reese.
Warren—J. G. Madden, S. H. Maby.

Southern or Ægyptus.

Lawrence,
Madison—E. S. Hull, B. F. Long, W. C. Flagg.
Marion—A. B. Crosby.
Massac,
Monroe,
Montgomery,
Perry,
Pope,
Pulaski—J. H. Crain, H. H. Marsh.
Randolph—W. W. Jeffries, T. Neilson.
Richland,
St. Clair—E. T. Babcock.
Saline,
Shelby,
Union—J. S. & S. S. Lawver.
Wabash,
Washington—J. M. Hunter.
Wayne—G. W. Wickersham.
White,
Williamson.

Ohio—J. P. Kirtland, East Rockport.
Indiana—George M. Beeler, Indianapolis.
Missouri—George Husmann, Hermann.

The lists returned vary a good deal in their value, according to the amount of experience, judgment and care of the persons returning them; but with proper discretion on the part of those who consult them, I believe important information may be derived from them. Greater assistance can always be gained from the views of individual fruit growers, than from any action taken by them in a corporate capacity. The unsatisfactory results often produced by our horticultural societies in making out fruit lists come from the fact that a body of men from all varieties of soil and climate endeavor to reconcile experiences too diverse to admit of comparison. Hence, although I here state arithmetical results, I would warn every one against implicit trust in such fallible guides for his own planting.

APPLES.—I. Northern Illinois.—The favorite apples for Northern Illinois appear to be:

For Profit—Carolina Red June, Red Astrachan, Early Pennock, Pomme de Neige, Domine, Jonathan, Winesap, Rawles' Janet, Willow Twig, Gilpin.

For Taste—Early Harvest, Carolina Red June, Benoni, Rambo, Pomme de Neige, Yellow Bellflower, Domine, Jonathan, Winesap, Rawles' Janet.

For profit, the Winesap appears to be the favorite, and next to this Pomme de Neige, Willow Twig and Early Pennock. For taste, Early Harvest and Pomme de Neige are the decidedly preferred varieties. Taking both profit and taste into consideration, Pomme de Neige stands first and Winesap second.

II. Central Illinois.—The leading apples on the lists for Central Illinois are:

For Profit—Early Harvest, Carolina Red June, Red Astrachan, Maiden's Blush, Rambo, Yellow Bellflower, Milam, Winesap, Rawles' Janet, Willow Twig.

For Taste—Early Harvest, Carolina Red June, Maiden's Blush, Fall Wine, Rambo, Yellow Bellflower, Milam, Winesap, Rawles' Janet, Willow Twig.

Rawles' Janet is here the prime favorite, both for profit and taste. The Winesap, Early Harvest and Maiden's Blush are next to it for profit, and Early Harvest and Yellow Bellflower for taste. Early Harvest stands next the Rawles' Janet for both profit and taste.

III. Southern Illinois.—The most approved sorts in Southern Illinois are:

For Profit—Early Harvest, Carolina Red June, Red Astrachan, Maiden's Blush,

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list for taste comprehends Early Harvest, Carolina Red June, Rambo, Yellow Bellflower, Winesap and Rawles' Janet. These seven varieties, therefore, may be said to be universally approved in the State of Illinois:

Early Harvest, for taste.
Carolina Red June, for profit and taste.
Red Astrachan, for profit.
Rambo, for taste.
Yellow Bellflower, for taste.
Winesap, for profit and taste.
Rawles' Janet, for profit and taste.

For profit Rawles' Janet stands first, succeeded by the Winesap, and for taste the Early Harvest with Rawles' Janet next to it. For both profit and taste, Rawles' Janet receives the highest vote of any apple for Illinois, and the Early Harvest stands second only to it.

PEARS.—Pears are not nearly so much cultivated or so well understood as apples, and the following lists are to be consulted cautiously:

I. Northern Illinois.—*For Profit.*—Bloodgood, Bartlett, Fondante d'Automne, Flemish Beauty, White Doyenne, Louise Bonne de Jersey, Onondaga, Duchesse d'Angouleme, Beurre d'Aremberg, Vicar of Winkfield.

For Taste—Bloodgood, Dearborn's Seedling, Barlett, Flemish Beauty, White Doyenne, Seckel, Louise Bonne de Jersey, Onondaga, Duchesse d'Angouleme, Beurre Diel.

The Bartlett receives the highest number of votes, both for profit and taste, and is followed by Flemish Beauty for profit, and Louise Bonne de Jersey for taste.

II. Central Illinois.—*For Profit*—Bartlett, Tyson, Fondante d'Automne, Flemish Beauty, White Doyenne, Seckel, Louise Bonne de Jersey, Duchesse d'Angouleme, Winter Nelis, Vicar of Winkfield.

For Taste—Bloodgood, Bartlett, Tyson, Fondante d'Automne, Flemish Beauty, White Doyenne, Seckel, Louise Bonne de Jersey, Winter Nelis, Vicar of Winkfield.

Here again the Bartlett leads the list for profit, but stands equal with the White Doyenne at the head of the list for taste. The Vicar of Winkfield is reckoned the second most profitable pear, and White Doyenne third in the list for taste.

III. Southern Illinois.—*For Profit*—Bloodgood, Bartlett, Fondante d'Automne, Flemish Beauty, White Doyenne, Seckel, Louise Bonne de Jersey, Duchesse d'Angouleme, Winter Nelis, Vicar of Winkfield.

For Taste—Madeline, Bloodgood, Bartlett, Fondante d'Automne, Flemish Beauty, White Doyenne, Seckel, Beurre Bosc, Winter Nelis, Easter Beurre.

The Bartlett again leads the list for profit, with no second, the Duchesse, Seckel and White Doyenne coming next. Bloodgood and Seckel lead the list for taste.

Comparing the three lists, we find the Bartlett, Flemish Beauty, White Doyenne, Duchesse d'Angouleme, Louise Bonne de Jersey, Vicar of Winkfield and Fondante d'Automne approved in all sections of the State, in the order named, for profit. The Bartlett, Flemish Beauty, Seckel, White Doyenne and Bloodgood, are on each of the three lists, both for profit and taste, and stand in the order named—the Bartlett leading among pears, with even a more decided majority than the Rawles' Janet among apples.

Some fruit growers are much inclined to give up the raising of this fruit, but others are eminently successful. The experience is very contradictory, and settles nothing definitely as yet.

PEACHES.—I. Northern Illinois.—Peaches in Northern Illinois are now a rejected fruit. The sad experience of severe winters has nearly extinguished all hope of the out-door culture of this delicious fruit and no lists were returned.

II. Central Illinois.—*For Profit*—Early Tillotson, Cole's Early, Large Early York, Crawford's Early, Coolidge's Favorite, Crawford's Late, George IV., Oldmixon Free, Oldmixon Cling, Heath Cling.

For Taste—Early Tillotson, Cole's Early, Large Early York, Crawford's Early, Coolidge's Favorite, Morris White, Red Cheek Melecoton, Oldmixon Free, Druid Hill, Heath Cling.

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III. SOUTHERN ILLINOIS.—*For Profit*—Troth's Early, Early York, Large Early York, Crawford's Early, Oldmixon Free, Crawford's Late, George IV, Columbia, Heath Cling, Smock.

For Taste—Troth's Early, Galbraith's Seedling, Large Early York, Honest John, Crawford's Early, Oldmixon Free, Oldmixon Cling, George IV, Columbia, Heath Cling.

Crawford's Early and Crawford's Late are the first in the rank of market peaches, succeeded by the Large Early York. Large Early York and Heath Cling stand first in the list for taste.

Taking the lists for both the Center and the South, we find Large Early York, Crawford's Early, Oldmixon Free, George IV, Crawford's Late and Heath Cling common to both the lists for profit, and Large Early York, Crawford's Early, Oldmixon Free and Heath Cling to the lists for taste. Crawford's Early, Large Early York, Heath Cling and Oldmixon Free are common to the whole set of lists, standing in the order of preference named, Crawford's Early being the leading peach.

CHERRIES.—The results of Cherry Lists are not very satisfactory, but here they are:

I. NORTHERN ILLINOIS.—*For Profit*—Mayduke, Bigarreau, Black Tartarian, Reine Hortense, Early Richmond.

For Taste—Mayduke, Bigarreau, Reine Hortense, Early Richmond.

II. CENTRAL ILLINOIS.—*For Profit*—Mayduke, Bigarreau, Governor Wood, Early Richmond, English Morello.

For Taste—Mayduke, Black Tartarian, Belle Magnifique, Reine Hortense, Early Richmond.

III. SOUTHERN ILLINOIS.—*For Profit*—Mayduke, Bigarreau, Black Tartarian, Governor Wood, Early Richmond.

For Taste—Mayduke, Bigarreau, Black Tartarian, Governor Wood, Early Richmond.

The Early Richmond and the Mayduke are the cherries upon which there seems to be a universal consent. The Bigarreau is found in all the lists for profit. The one popular cherry, however, greatly preferred over any and all others, is the Early Richmond.

PLUMS.—The vote upon plums is very scattering and unsatisfactory. The following is perhaps the most that can be made of the lists:

NORTHERN.—*For Profit*—Lombard. *For Taste*—Washington, Green Gage.

CENTRAL.—*For Profit*—Lombard, Imperial Gage, Smith's Orleans, Coe's Golden Drop. *For Taste*—Lombard, Green Gage, Smith's Orleans, Coe's Golden Drop, Reine Claude de Bevay.

SOUTHERN.—*For Profit*—Jefferson, Coe's Golden Drop. *For Taste*—Jefferson, Washington, Coe's Golden Drop.

APRICOTS.—Not grown in the north. In the center the Peach and Moorpark stand first, and in the south Peach, Moorpark and Early Golden. Good crops were grown the past season at Alton, St. Louis and Hermann, and probably at other points. Very few lists were returned.

NECTARINES.—N. Chaffee, of Tolono, Champaign county, names Boston as preferred, and Pitmaston's Orange and Downton. Jabez Capps, of Logan county,

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II. Central Illinois.—Here Catawba, Clinton, Concord, Delaware and Isabella are voted most profitable, and in the order named, and Catawba, Concord, Delaware and Rebecca for taste.

III. Southern Illinois.—Catawba, Concord, Clinton, Norton's Virginia and Delaware receive the Egyptian suffrages for profitable wine, and Catawba, Concord, Norton's Virginia, Delaware and Isabella for taste.

The Catawba is the most approved wine grape for the whole State, both for profit and taste.

TABLE GRAPES.—I. Northern Illinois.—Concord, Isabella, Delaware, Hartford Prolific and Delaware, are voted profitable in the order named; and Delaware, Concord, Diana, Rebecca and Isabella are reckoned best.

II. Central Illinois.—Concord, Delaware, Isabella, Catawba and Hartford Prolific most profitable. Catawba, Delaware, Diana, Isabella and Concord best.

III. Southern Illinois.—Concord, Delaware, Catawba, Clinton and Hartford Prolific are voted most remunerative; and Catawba, Delaware, Diana and Concord best.

Taking the whole State into consideration, the Concord is the most profitable table grape, with the Delaware standing next to it. The Delaware is reckoned the *best* table grape.

CURRANTS.—There is a good deal of uniformity in the different currant lists. Putting them in the order of preference, they stand thus in the three districts:

Northern.—*For Profit*—Red Dutch, White Dutch, Cherry, White Grape, Black Naples. *For Taste*—Red Dutch, White Grape, White Dutch, Cherry.

Central.—*For Profit*—Red Dutch, White Dutch, Cherry, White Grape, Victoria. *For Taste*—White Grape, Red Dutch, White Dutch, Cherry, Victoria.

Southern.—*For Profit*—Red Dutch, Cherry, White Grape, Victoria. *For Taste*—White Grape, Cherry, Victoria.

Taking the whole State, the Red Dutch, has a very decided preference for profit, and the White Grape a less decided one for taste.

GOOSEBERRIES.—Houghton's Seedling enjoys a monopoly of gooseberry culture, and has no rival either for taste or profit in any of the districts, unless it be the American Seedling.

RASPBERRIES.—There is a good deal of unanimity in the votes given for this fruit, the difference being generally in the order of preference.

Northern.—*For Profit*—Purple Cane, Brinckle's Orange, American Black Cap, Red Antwerp, Franconia. *For Taste*—Brinckle's Orange, Red Antwerp, Purple Cane, Franconia, American Black Cap.

Central.—*For Profit*—Red Antwerp, Brinckle's Orange, American Black Cap, Ohio Everbearing, Catawissa. *For Taste*—Red Antwerp, Brinckle's Orange, American Black Cap, Ohio Everbearing, Purple Cane.

Southern.—*For Profit*—American Black Cap, Red Antwerp, Franconia, Brinckle's Orange. *For Taste*—Red Antwerp, American Black Cap, Brinckle's Orange.

In the entire State the Red Antwerp has the highest vote for market, with the American Black Cap as a formidable competitor, and Brinckle's Orange not far behind. For taste Brinckle's Orange is first with the Red Antwerp, and the American Black Cap next to it. The raspberry standing highest, on each list combined, is the Red Antwerp.

BLACKBERRY.—The best blackberry is undoubtedly the New Rochelle or Lawton, with no respectable competition.

STRAWBERRIES.—The vote upon strawberries is scattering, excepting upon the Wilson's Albany. The following is the most that can be made of it:

Northern.—*For Profit*—Wilson's Albany, Necked Pine, Triomphe de Gand, Iowa, Hovey's Seedling. *For Taste*—Wilson's Albany, Triomphe de Gand, Hooker.

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CENTRAL.—*For Profit*—Wilson's Albany, Triomphe de Gand, McAvoy's Superior, Iowa, Hooker. *For Taste*—Wilson's Albany, Triomphe de Gand, Hooker, Hovey, McAvoy's Superior.

SOUTHERN.—*For Profit*—Wilson's Albany, Triomphe de Gand, Early Scarlet, Iowa, Longworth's Prolific. *For Taste*—Hovey's Seedling, Triomphe de Gand.

Wilson's Albany stands first, with no second or third, as a market fruit in all the districts, the next best being Triomphe de Gand, which is a more formidable rival on the list for taste.

The following tables will show more clearly the results arrived at:

1.—MARKET FRUITS MOST APPROVED.

Kind of Fruit.	*Northern.*	*Central.*	*Southern.*
Apple	Winesap	Rawles' Janet	Rawles' Janet
Pear	Bartlett	Bartlett	Bartlett
Peach		Crawford's Early	Crawford's Early
Cherry	Early Richmond	Early Richmond	Early Richmond
Plum	Lombard	Lombard	Jefferson
Apricot		Moorpark (?)	Moorpark (?)
Nectarine		Boston (?)	Elruge (?)
Quince	Orange	Orange	Orange
Wine Grape	Catawba	Catawba	Catawba
Table Grape	Concord	Concord	Concord
Currant	Red Dutch	Red Dutch	Red Dutch
Gooseberry	Houghton	Houghton	Houghton
Raspberry	Purple Cane	Red Antwerp	Am. Black Cap
Blackberry	New Rochelle	New Rochelle	New Rochelle
Strawberry	Wilson's Albany	Wilson's Albany	Wilson's Albany

2.—MOST APPROVED FRUITS FOR TASTE.

Kind of Fruit.	*Northern.*	*Central.*	*Southern.*
Apple	Early Harvest	Rawles' Janet	Early Harvest Newtown Pippin
Pear	Bartlett	Bartlett White Doyenne	Bloodgood Seckel
Peach			Large Early York Heath
Cherry	Mayduke	Mayduke Early Richmond	Mayduke
Plum			
Apricot			
Nectarine			
Quince	Orange	Orange	Orange
Wine Grape	Catawba	Catawba	Catawba
Table Grape	Delaware	Catawba	Catawba Delaware
Currant	Red Dutch	White Grape	White Grape
Gooseberry	Houghton	Houghton	Houghton
Raspberry	Brinckle's Orange	Red Antwerp	Red Antwerp
Blackberry	New Rochelle	New Rochelle	New Rochelle
Strawberry	Wilson's Albany	Wilson's Albany	Wilson's Albany

These results must, of course, not be regarded as sufficient and final. They show that the above named fruits are most approved; but this does not go a great way to show that they are prospectively the best in a state of horticulture so new and transitory as our own. The associations of youth, ignorance of better sorts, assiduous puffing, success with neglected culture, and other reasons often warp the judgments of fruit growers, and render their decisions of uncertain value.

In conclusion, I would submit the reports received in detail,* that all or such part of them as the Publishing Committee may see fit, may be published in ear-

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FOOD PLANTS.

September 10, 1863, during the Fair at Rockford, Dr. Warder, in accordance with a previous invitation, delivered the following lecture:

Mr. President, Fellow Members, Ladies and Gentlemen of our Common Country:

FELLOW CITIZENS: While acknowledging the honor of the appointment of so humble an individual to the enviable position he now occupies as your *guest*—allow him a moment of explanation, before entering upon the business of the evening. He has for more than a decade of years made pilgrimages annually or oftener to the shrines of the glorious *temple of Horticulture and Carpology*, which you have been erecting upon broad foundations, in the grand prairie regions of the great Northwest. He has come, as an humble student of *Pomology*, *Horticulture*, *and Rural Taste.* Rather than as a teacher of others, he has come hither to learn from you. In former years, as at this time, his carpological investigations have been his chief occupation. From the keen, bright, and most intelligent horticulturists and pomologists of your prairie land, he has ever sought that information which he needed, and has never been disappointed in attaining the desiderata of which he was in quest, except when his own indolence, or want of tact has prevented him from attaining his objects.

With *Pomology* he has been so intimately connected that he has been perhaps associated in the minds of most of his Western friends with a large or handsome specimen of the genus *Pyrus malus*, or apple. Your Ohio friend (* * * pardon the entered claim of *friendship*, Mr. President,) for your ever ready reception of an unworthy guest has spoiled him—but still your friend and admirer from the Buckeye State, has so interwoven and associated himself with your advances in fruit and fruit culture—that some of you may have grown a-weary of his apple-talks—and he presents himself before you to-night with a new topic—he enters upon a larger field—true, it is not a very etherial one—not at all metaphysical, nor *spirituelle*, but most practical—he wishes to break the trammels that have bound him to one line of thoughts, and to throw himself into another and wider field of Botanical investigation. Hence, upon this occasion he would prefer the subject of *Food Plants*—a topic of great breadth—and of intimate interest to us all as gastronomics—and likewise somewhat cognate to our vocation as horticulturists.

A fellow member, at Tuesday evening's meeting, traced in elegant style and horticultural phraseology—the natural *history of man*, in his progress from the barbarous to the *civilized* condition, as illustrated by his *food*—the native Indian digging roots and killing wild game—the semi-barbarous selecting the more choice morceaux and the seeds of grain plants, progressively breaking and preparing them, and adding the flesh of domesticated animals—

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the more elevated and civilized, having applied skill in preparing the nutritious and perfected grains and fruits, man has acquired the distinguishing title of a *cooking animal.* The gentleman might have gone on, in tracing the idea—he did allude to the more advanced stage of civilization, in which man cultivates, enjoys, and even consumes as food, in some cases, the beauteous floral expansions of the vegetable kingdom—*eating* flowers as well as using them to ornament his festal board.

In examining the composition of *food*, one of the first circumstances that strikes us with regard to the character of our diet, is that it almost exclusively consists of organic matter. The ultimate elements of which it is composed, have previously been united in definite proportions in pre-existing compounds. These again and again have been decomposed and re-compounded into new forms of vegetable and animal life, but by tracing back the series we ever come to the same result, and meet the same answer to the question "What does man live on?" and find with Schleiden, that it is *dust.* All animals have such an organization as to require this sort of preparation of their *dust* or *food*, which is effected, either directly or indirectly, by the vegetables, *by plants.* These organizations, however, do appear fitted to come into immediate contact with, and to derive their sustenance more directly from, the mineral kingdom, and in their internal economy, they digest, or prepare the food of man and other animals. Even here, among the plants, we find a difference in their capacity; some can derive their subsistence from the flinty rock, some from the water, and some from the very air, while others require a more or less fertile soil for their support; they too need a digested or prepared food, and one agricultural writer of eminence, in our country, insists strongly upon the application of this fact in his theory of manures, and has elaborated his doctrine of "*the Progression of the Elements*" by these successive digestions, and explains the results of *high farming* and *gardening* by the fact, that in high cultivated soils, much of the plant-food has been repeatedly *combined* and *recombined* in organic forms, and that therefore it is in a more highly "*progressed*" condition, better fitted for its purpose of sustaining vegetable life. He applies the same theory to the food of animals and of *man.* I shall not attempt to analyze this theory of *Progression.* Having alluded to it, I may say that an exceedingly ingenious and very learned and highly intelligent individual is its author and advocate, and that he brings some very strong arguments from nature in support of his theory, but, unfortunately, in this age of reason, investigation and argument, his starting point is dream-land—like the famous, though yet unknown grape, "Eureka," of the enthusiastic horticulturist, W. R. Prince, which, instead of coming legitimately from a seed, was mysteriously transmitted from another sphere, through *mesmeric* influence, by the spirit of his departed parent, the distinguished Wm. Prince. So,

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too, this vaunted "*Theory of Progression of the Elements*" was handed to Prof. J. J. Mapes, by a so called *medium*, from the spheres of light and knowledge. * * * * Let us have a sufficiency of *observed facts* before erecting a theory, lest our weak human natures should perchance yield to the captivating delusion of bending facts to the support of our favorite theories.

I have already stated that the food of animals is *almost* exclusively organic matter; we must not overlook those important, essential articles of our support, *air* and *water*, which belong to the mineral kingdom, but which are so admirably, so wonderfully adapted to the wants of animal life that the evidence of *Design* in the Creator of the universe, may be conclusively drawn from their consideration and study alone. Both of these mineral substances, being essential to animal life, may, in some sense, be considered articles of food—but they need not longer detain us upon the present occasion, when we have proposed merely to point out to you some of the sources, in the *vegetable kingdom*, whence man, and some of the animals under his care, derive the chief share of their vegetable aliment.

In making chemical analyses of the various kinds of human food, we are surprised to find that all, how dissimilar soever, are composed of nearly the same ultimate elements, and that a very few of these are constantly changing in the varying compounds that we have subjected to the analyzing process. They are chiefly *Carbon*, *Hydrogen*, *Oxygen* and *Nitrogen*.

The poet Scheilden, who was also quite a philosopher, said,

> "Four elements,
> In one firm band
> Give form to Life,
> Build Sea and Land."

In addition to these four leading elements, three of which, Nitrogen being omitted, combine in various ways to form a vast number of different proximate compounds, we find also small proportions of several other elementary substances combined with them in the vegetable products which are used as food. These substances, though in very small proportions, appear to be essential to the nourishing qualities of the food we consume, and animals that are fed on compounds that consist exclusively of the three or four elementary bodies above mentioned, are found to suffer literally from starvation.

These other elements have been used to characterize and to classify our food plants, thus Liebig divides our cultivated vegetables into four classes, according as their characteristics depend upon their constituents composed of ready soluble salts; of earth, especially lime and magnesia; of phosphoric acid; of silicic acid or silex. Or 1, alkali plants, such as potatoes, beets; 2, lime plants, such as clover, peas, beans, etc.; 3, phosphorus plants, such as wheat, rye, etc.; 4, silex plants, such as grapes.

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When we take even a casual and rapid survey of the vegetable kingdom, looking for those plants that furnish the greatest amount of food for man, and the animals under his care, we find an immense group or natural family prepared for that purpose by our All-wise Creator. These are the grasses, composed of some 230 genera, and perhaps 4,000 species, that are widely diffused over the surface of the globe, and adapted to very diverse situations as to latitude and elevation; they are spread from the equator to the polar circle, and from the submerged marshy fens by the sea-shore to the tops of the mountains, on the very verge of the Alpine glaciers, and northward to the region almost of perpetual congelation, where they can enjoy but a few weeks of sunshine. They are also suited to every variety of soil, and are found upon the rocky promontory, where their slender fibres can penetrate but a small crack; upon dry gravelly knolls, and even upon blowing sands, which, indeed, they bind together with their multitude of small roots, so as to defy the action of winds and waves upon the sea shore. They clothe with verdure the stiffest clays, and also thrive in the loose, black soils of our vast prairies. Every soil and situation has grass plants appropriate to it, so that pasture of "the green herb" is provided by the benevolent Creator for all his creatures. Of this great family of plants, which is, perhaps, the most important group, when considered in relation to man, we find that the seed and herbage furnish a principal portion of the food of the race, and the races under his control.

Many of the grasses, however, are mere weeds, and appear to have little or no value; but others are more noble. Those especially which furnish nutritious seeds, will naturally claim our attention first. These are the CEREALIA, the grain plants. Of the immense number of grasses, however, we find but about 20 yielding us food. These will be considered in order :—

Triticum Vulgare, or common wheat, stands in the foremost rank among cultivated plants as the food of man; in the temperate zones, it is especially, it is widely diffused and largely cultivated, yielding the staff of life to millions. Though rice is said to be more extensively used, and to feed more human beings, wheat has this advantage, that its elements are more varied, and that they embrace more of the essentials to animal life than those of any other plant.

Analysis of wheat shows it to consist largely and chiefly of starch, 62 per cent., hence its value as food, and as a source from which to derive this useful material. It also contains Nitrogen, as the flesh producing element, in its GLUTEN, of which different an-

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ing the grain, hence the flour is often damaged, and the dough "*runney*," making the bread close and heavy. A pretty good estimate of the amount of gluten in a sample of flour may be made by wetting it, kneading the dough and pulling it, when its tenacity, or the length of the thread, will show the proportion of gluten it contains.

Albumen, similar to animal albumen, such as the white of eggs, is also found in wheat flour. These two proximate principles—*gluten* and *albumen*—both nitrogenous compounds, have been estimated by one analyst as high as 19.5 per cent.

All wheat contains a considerable quantity of water, intimately combined with the other elements of the grain, and remaining in the flour, not driven off by heating. This is found to be greater in northern than in southern wheat, from a dryer climate—and this hygroscopic condition is well understood by the bakers, who will pay a higher price for the southern flour, knowing that in their manufacture of bread it will take up a larger proportion of additional water, and thus make a larger weight of bread. The per centage of water ranges from 10 to 14.

Wheat contains also some important mineral products, which are among its most valuable elements as an article of food to animals. In the ash of wheat we find 47 per cent. of phosphoric acid, combined with magnesia, soda, lime, potash and iron—some of which solid substances go into the formation of our blood and bones.

Silica, or sand, is also necessary to wheat, and constitutes a considerable proportion of its straw, from 40 to 70 per cent., and 80.60 per cent. of the chaff of wheat.

The history of this important cereal grass is coeval almost with the human race, so that its native origin is lost. Some modern observers and writers have asserted that it is only an improved condition of the *Ægilops ovata*. If this should prove true, it will show that the botanists have blundered, for it may be assumed that neither species, nor, still less, genera, ever change from one to another. *Variations* do often occur under the influence of culture, but the *genuine* and *specific* characters remain in all their *sports*, *varieties* and *crosses*. If, therefore, the wheat plant belongs properly to the *Ægilops*, they can never be transformed the one into the other. Most botanists of the present age disbelieve Fabre's statement.

Some farmers think that wheat may become degenerated into CHESS, *Bromus Secanlinus*, but no botanist can be persuaded that the essential characters of any plant can ever be so entirely changed.

There are many "false facts" and erroneous "observations" which are often quoted by those who argue the *affirmative* of the cheat question, but they all yield to the *lights of science* or to *true observations* of nature as it is.

Rye, or *secale cereale*, stands next to wheat in its bread-making

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qualities—but though a favorite with those who are accustomed to its use, the bread is not equal in nutritious qualities to that made from wheat. It is used to a considerable extent in feeding the domestic animals, in some sections of our country, both as grain and as grass. In the latter form it is of great value for winter pasture for cattle, and it is also largely used in some parts of the country for feeding swine in the field of ripening grain, a slovenly but economical procedure. Rye will thrive on lighter and more sandy soils than wheat, and will succeed in more northern latitudes. It is the source of the bread of Northern Europe, particularly Germany and Russia. It is much cultivated in the eastern and northern portions of our own country.

The *Ergot of Rye* is a deterioration of the grains, one or more on a head being occupied by a fungus growth, particularly in wet seasons. It often injures the value of the crop, as it is very poisonous to man and animals, but valuable in medicine. In some parts of Europe terrible results have followed its use, but this is only an evidence of their backwardness in improved agricultural implements, for the ergot is so large that the grains are all separated by our common winnowing apparatus, the fanning mill, such as is found upon every farm in our country.

Rye is considered a native of the East, and has long been introduced into agriculture. There is but one species.

In this country rye is not much used as food for man, though very much liked by those who are accustomed to it. The flour has gluten enough to make good bread, though less than wheat. It has a good deal of sugar, causing the sweet taste, and also making it very liable to sour, and enabling the grain to *malt*, like barley, for the preparation of beer, but it is not equal to barley for this purpose. This grain is distilled also. Linnæus describes a curious practice in Lapland, that of sowing rye and barley together in the early spring. The barley springs up at once, ripens its ears early, and is harvested, while the rye shoots out on the ground only, having been smothered by the more rapidly growing grain until it is cut, when the rye shoots up and perfects its seed.

The origin of Barley, *Hordeum*, is involved in obscurity. Some writers claim the north of Asia, while others cite Diodorus to prove that the north of Africa was its native place. This grain has a

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very nutritious food for horses and other cattle, particularly when ground, and it is fed with advantage to laying hens in the winter. In the northern countries of Europe it is used as human food. In the shape of cakes, or "bannocks o' barley meal," it is almost a national dish in Scotland and the north of Britain, and further north it becomes a sole bread grain. There is another species or variety of barley which has no husk, hence called naked or skinless barley.

The Oat, *Avena Sativa*, like most of our cultivated grains, has been so long subject to man that its origin is involved in obscurity. This grain is best adapted to a cool, moist climate, and, indeed, can scarcely be cultivated with profit in low latitudes, the grain being light, and subject to many mishaps. It is adapted to thin soils, and when the land is too rich it grows enormously, but the straw is weak, falls down and yields little grain. Oats are appropriate for horse feed, but are also used, to a limited extent, as any article of the *Materia alimentaria* as *oat meal gruel*, in convalescence in this country, and for "*parritch*" in Britain.

The animated oats, *A. Sterilis*, is very curious, and is cultivated only on that account.

Zea mais, or Indian Corn, Maize, is believed to be of South American origin. Some consider it North American, or from Central America. The Indians cultivated it when the country was first discovered by Europeans, and we have obtained from them one of the most valuable of all the cereals. It was introduced into Europe by the Spaniards, in the 16th century, and by them taken to Sicily, hence in Europe, where all edible grain is called *corn*, it was called Spanish, Sicilian and Turkish corn. *Fuchs*, the botanist, thinks it was introduced into Germany about 1545, from Greece or Asia. Mr. Bonafons, who has written a noble work upon our Indian Corn, cites several authors who claim its Eastern origin. but he also proves that they were mistaken. Humboldt says "there is no doubt in the minds of botanists that *mais*, or *Turkish wheat*, is truly American, and that the New World gave it to the Old World. When Europeans first discovered America, *Zea mais*, in the Aztec language, *thaolli*, in the Hatian, *mahiz*, in Quichua, *cara*, was cultivated from the southern region of Chili, as far as to Pennsylvania. According to a tradition of the Aztecs, the Toltects introduced maize, cotton and pimento into Mexico about the 7th century.

After giving the testimony in considerable extent, Mr. Klippart concludes that this grain was known to the Old World before the discovery of America, and that it was either spontaneous in both, or that it migrated from one to the other with the ancients.

The importance of this invaluable grain cannot be easily estimated. Little do we realize how great a boon it is to our country. The immense yield of the crop—being several hundred per cent.—makes it exceedingly valuable. The facility of its culture, and the vast extent of country through which it is the favorite and most

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suitable grain crop, makes our favored land capable of sustaining the most dense population, and enables us also to produce the greatest amount of animal food.

The vast fields of the fertile West, such as Illinois, appear capable, of themselves, to sustain the heaviest population and to produce the largest amount of stock that could ever be required by the whole country—since but a fractional portion of these broad savannahs, has as yet been brought under the dominion of the plow and cultivator.

The United States census for 1860, presents us with a total of 830,457,707 bushels of corn.

Rice, *Oryza Sativa*, is tropical or sub-tropical production. It is a native of Asia, being still found wild on the Ganges, but Humboldt discovered a species in Venezuela, (*oryza latifolia desoeaux.*) It has also been found wild in the interior of the Rio Negro, and in Peru in South America, so that rice may be native of both hemispheres. In this country it was introduced from the East Indies, in 1701, from Madagascar; seed left by a brigandine was cultivated. It was afterwards received from the East India Company.

Rice is chiefly grown on low lands in our Southern States, where it may be overflowed at will. It is sometimes sown on damp rich uplands in Arkansas, but the largest yield is obtained where it may be irrigated. Small patches of rice are grown still further to the north in Kentucky, Illinois and Missouri, and its cultivation to a moderate extent, for family use, has been recommended in Illinois, throughout the State.

The seed is covered by a tight hull or skin. In this state it is called "paddy." This hull has to be removed before it is used. Darlington says the importance of this plant to the inhabitants of the tropics, but especially in Asia, can scarcely be estimated by the residents of higher latitudes. It is believed that the seeds enter more largely into the nourishment of the human family than those of any other plant—not excepting wheat.

U. S. 1860, 181,150,163 lbs. Kentucky produced 16,376 lbs. in 1840.

The *Wild Rice*, *Zigaria aquatica*, is a coarse, reedy grass that abounds in lakes, marshes and tide waters On the Delaware it is the favorite food of the Reed bird, *Emberiza orizivora*, or Bob-

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The *Sugar-cane* of the tropics, *Saccharum officinale*, has been introduced into Louisiana, and with the fostering care of government the manufacture of sugars has been conducted successfully, but the climate is hardly hot enough for this plant. As it does not seed so far from the tropics, it is propagated by cuttings; old canes are lain in furrows and slightly covered with soil, so that they root and grow; these are called rattoons, and the first crop is called seed-cane. Without government protection our planters could not compete with the West Indies.

Sorghum Saccharatum (?) or Chinese sugar-cane, has been introduced into the Middle States within a few years, with a view to the propagation of sugars. Experiments have been extensively conducted in various parts of the country, which prove conclusively that sirups and sugars can be produced in the Northern States, rendering us independent of the tropics, to a limited extent at least. Of the Sorghums there are several species or varieties, according to botanists. A. Gray, in his manual, incidentally mentions them as *varieties* of *Sorghum valgare*, and cites broom-corn, Indian millet and Guinea corn. To these he might perhaps have added the Imphees, Dourrha and Chocolate corn. The species above named, *S. saccharatum*, was introduced from China into France by Mr. Vilmorin. Mr. Wray brought many varieties from Africa, where they are much cultivated.

The Broom-corn, *S. vulgare*, has an incident connected with its history which shows the importance of observing small matters with a close and intelligent scrutiny, and illustrates the ultimate value which may grow to a country from the preservation of a single seed. It is related of Dr. Franklin that when he was shown a curious brush, that had been brought from Eastern Asia, he examined its material carefully, and among the branches of which it was composed, he found a seed. This he took and planted, and from this source has sprung our valuable crop of broom corn, covering thousands of acres, giving occupation to thousands of industrious workmen, yielding millions of money, and better still, making millions of homes *clean and happy*.

While speaking of sugar we may refer to some other sources of this material so necessary to civilized life. All true sugars are derived from vegetables.

The ancients were acquainted with honey, manna, and the sugars of grape and fruits; to these we can add the sugars we derive from the cane, the maple and other trees, from beets, maize, and also Palm sugar. Potatoes and other substances that abound in starch are made to yield us sugar; the sea-weeds furnish it—even sawdust may be converted into it, and we also have sugar of milk.

In connection of the millions of tons of sugar that are consumed, the thousands of ships that are engaged in its transport, and the millions of men who are engaged in the plants that yield it, Johnson adds, "it may be said to exercise a more direct and ex-

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tended influence, not only over the social comfort, but over the social condition of mankind than any other production of the vegetable kingdom, with the exception, perhaps, of cotton alone." The same author divides sugar into four classes: Grape Sugars—grape, honey, fruits, and from starch, rags, paper and wood; Cane Sugars—cane, beet, maple, maize and sorghum; Manna Sugars—fraxinus ornus and rotundifolia, sea-weeds, encalypters, tamirix, etc., etc.; Glycirdeiza and Milk or Animal Sugars.

Cane Sugars are derived from plants, the juices of which are free from acid, which transforms cane sugar into grape sugar. Eleven-twelfths of all the sugar used is made from the sugar cane, a native of the Old World, but now mostly cultivated in the New. It likes a tropical climate, with a mean temperature of 75 deg. to 77 deg., but may be cultivated where it is from 66 deg. to 68 deg. In tropical regions the ripe canes yield from 18 to 22 per cent. of sugar, but in Louisiana the proportion of sugar in the juice is as low as 12 to 14 per cent. (Pat. Off. Rept. 1848.)

Census 1860—Sugar 302,205 hhds. (One hhds is equal to 1,000 lbs.) Molasses 16,327,080 gallons.

Cane sugars are sweeter than grape sugars, as 5 to 3. They dissolve more readily in water. One lb. of water dissolves three lbs. cane, but only one lb. of grape sugar. The sirup is thicker and crystallizes more readily, and the crystals are harder.

Dilute acids change cane to grape sugar either in nature, in the fruits, or in the laboratory. Hence, souring of cane juice prevents crystallizing.

Beet sugar has long been manufactured in Europe. This manufacture was introduced by Napoleon 1st, to be independent of other countries. It has been attempted in this country some years ago; again in 1862, to some extent, by M. Mot, near Newark, Ohio, now in Illinois, upon a large scale, and with flattering prodects. Beet juice contains 10 per cent. of sugar.

The Germans made but two or three per cent. of real sugar, but the French, with better skill and appliances, made four to five per cent. from the beet. Improved methods enable them now to extract six to seven per cent. in France, Belgium and Germany.

Palm or Date Sugar—Most palms when cut at their top shoot yield an abundance of sweet juice which gives, when boiled, a coarse

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from the cane. Before refining it has a peculiar flavor, which is much liked. The quantity prepared in America has been estimated at forty-five millions of pounds. U. S. 1860, 38,863,884 lbs. Molasses 1,944,501 gallons.

Sugar has been made to some extent from the Birch, in the northern portions of this continent, but it is generally of an inferior character. To this prairie State, however, we are indebted for the discovery of another sugar tree, one which abounds in the maple forests of the West, but was never suspected of being a useful tree, much less as being a source of sugar. I refer to the *Acer Negundo*, or *Negundo Aceroides*, the Ash-leafed Maple or Box-Elder—which is now being largely planted for sugar orchards.

Maize or *Mexican Sugar* is prepared from Indian corn. It was known to the Mexicans before the invasion of the Spaniards, hence its name. The manufacture is conducted at Toulouse, south of France. The attempts made in this country have not proved successful, owing to the want of skill or to the low price of the product.

Sorghum Sugar.—The introduction of this branch of culture and manufacture into this country has received a great impetus within a few years, especially since the interruption of commerce upon the Mississippi. For a long time our farmers and manufacturers were satisfied with the production of sirups, and many believed that the plant would not yield crystallizable sugar; but new talent, with new and improved machinery, directed by proper chemical knowledge have enabled us to bring about very different and quite satisfactory results, and at the present remunerative prices, the manufacture can be sustained.

The juice of the Sorghums contain, according to Mons. Vilmorin, from 10 to 13 per cent. of sugar.

U. S. Census 1860, 7,235,025 gallons.

De Stolle estimates the total amount of cane sugars as follows:

	No. of pounds.	Per cent. of all.
Cane Sugar	4,527,000,000	87.7
Beet Sugar	362,000,000	7.3
Palm Sugar	220,000,000	4.2
Maple Sugar	45,000,000	0.8
		100

Consumed by Russia—1½ pounds per head.
" Belgium—5 " " "
" France—7½ " " "
" Britain—28 " " "
" Venezuela—186 pounds per man, ¼ lb. per [illegible]

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per cent., and from 5 to 10 per cent. of a grape sugar, fermentable; when fresh it may be used for food, if stale it becomes medicinal.

Some sea-weeds yield manna. The Eucalyptus sugar is from the Eucalyptus resinfera of Australia, whence it falls like a shower when the wind blows the manna from the leaves.

Some other sugar plants are Quercus mannifera, Larix Europea, Pinus cedrus, Hedysarum alhagi, Tamarix mannifera.

Licorice sugar is ground from the *Glycirrhiza glabra*, which is cultivated in England. This kind of sugar is used in medicine, and more largely by the brewers.

Sugar of Milk, though chiefly animal in its origin, has also been found in acorns. It is more solid, hard, and less soluble and less sweet than cane sugar.

The amount of the product is small, prepared from milk, and used chiefly in medicine.

Passing from this digression that I might present "SWEETS TO THE SWEET," and having introduced several of this large natural order, the family of grasses, such as are applicable to human food, we find a very large number that are justly of great value, being adapted to the sustenance of the inferior animals. All of those already considered are also often appropriated to them, as well as to the more dainty appetite of man. A few of these grasses might be mentioned as the most valuable fodder plants. Most of the pasture grasses are adapted to a moist, cool climate, and it is there only that they produce the most compact turf of velvety green, which is described by the English poets, but which we seldom realize in this country, where, too, our grass *swards* have a smaller number of varieties than there. We think our blue grass pastures are very beautiful when they start afresh in the early spring, but they do not equal the velvet sheen of mixed lawn grasses, produced in a moister soil and more humid climate.

To meet this difficulty, where we determine to have the most beautiful effect possible for us, without regard to cost, we should thoroughly prepare the soil by trenching it, or at least we should trench plow and sub-soil, as well as underdrain the land in the preparation for the lawn. Then, by sowing very thickly, a variety of the grasses that have fine foliage of slender leaves, by frequent rolling, by the occasional use of lime and ashes, and after the first year by repeated mowing of the grass, a very fine effect may be produced. We may point with pride to the Spring Grove Cemetery, near Cincinnati, for the beautiful effect of judicious treatment.

Timothy grass, or Cat's Tail, or as it is called in New England, Herd's Grass—is the *Phleum pratense* of Linnæus, a European species, introduced and we may say naturalized in this country, where it is highly valued as a pasture grass. In our market the hay commands the highest price. If not sown sufficiently thick it grows in bunches or top socks, and the stalks are too coarse to be closely eaten by stock. As a pasture it is not valuable, because

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the aftermath is not abundant, and it is often seriously injured by close feeding, so as to destroy the little bulbs that are formed at the base of the culms that bear the seed. These seem to be reservoirs of nutrition for the next year's growth, and should be preserved. That scientific observer, Professor Kirtland, has settled the question as to the proper season for cutting Timothy, which had been long under discussion, by apprizing the world of the importance of these bulbs, and that they were not matured properly until after the seed of this grass was formed and nearly ripe. Hence the old plan of sowing clover with Timothy is objectionable, since the first is too ripe before the latter is sufficiently matured. The market, however, has also settled the question as to the mixture, since purchasers depreciate the value of the hay in proportion to the amount of clover.

In sowing this grass the ground should be well prepared, an abundant supply of clean seed should be sown in August or September, and covered with a light seed harrow or a brush drag. A peck is usually advised per acre, but double this amount is decidedly preferable, and one bushel has been recommended. Timothy is often sown among grain in the early spring, but it is better to lay down the meadow in the fall, and alone, when a crop may be expected next season.

The *Agrostis vulgaris* is the Red-top, or the Herds-grass of this country. This grass is valuable as a mixture in pastures, and may be used to advantage in very wet grounds, where it forms an exceedingly close turf, even upon boggy lands and shaking prairies—the hay is light and not highly valued.

This is one of the kinds of grass known in Europe as Bent-grass—another species, *Agrostis alba*, is the Fiorin grass that was highly lauded some years ago for its great yield of hay, but which has fallen into disrepute.

The *Muhlenbergia diffusa*, or Nimble Will, is a common grass which is rather known as a troublesome weed, but which furnishes a pretty good pasture. The roots of this grass are numerous, scaly, hard, and exceedingly tenacious of life, so that is quite troublesome in cultivation.

Calamagrostis canadensis, or Blue-joint, is a native of the Northwest, affording good pasture upon its wide leaves, that are greedily eaten by cattle.

Calamagrostis arenaria—Beach-grass or mat-grass, is not valuable as an article of food for cattle, but its fine roots served to bind

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supperless to bed, but in the morning their breakfast would be already grown for them. When sown with clover for hay, it has the advantage of ripening with that legume which Timothy does not. The after growth is very luxuriant, hence it makes fine pasture. If not sown quite thickly it grows in bunches. In consequence of its rapid reproduction, after being cut or pastured, Dr. Darlington thinks Virgil's lines very appropriate to this grass:

> "Ex quantum longis carpent armenta diebus,
> Exigua tantum gelidus ros nocte reponet."—*Georg.* 2, 201.

as rendered by Sotheby:

> "Cool dews restore, beneath night's transient hours
> All that the herd each livelong day devours."

From its name we may infer that this grass will thrive in a partial shade; and indeed it is appropriate for woodland pastures and for orchards, if, indeed, any grasses be admitted among fruit trees.

The name Poa, meaning herbage or pasture, has been very appropriately applied to a genus which embraces several valuable grasses, among which is our favorite pasture, the Blue-grass.

Poa annua is the smallest, too diminutive to be of much value, but very early, blooming in March and April. *Poa serotina* is the Fowl-meadow-grass or False Red-Top. It is valuable for wet meadows, especially to the north of this. *Poa trivialis*, or Rough-Meadow-Grass, is common in moist lands and meadows, yielding good pasture and hay. In the shade it is very slender and of little value.

Poa Pratensis, is the Spear-Grass of Pennsylvania, the June-grass of New York, and the Kentucky Blue-grass of the fertile limestone soils of the West. This valuable pasture grass springs very early in the season, giving a beautiful rich green carpeting to our hills and woodland pastures, to which it is as well adapted as to the level black prairie soil of the West. It ripens its seed early in July, but the heads remain a long time, and affords a very fattening pasture. The aftermath of long radical leaves that spring up after harvest, and falling down in great locks, called horse-manes, remain green during the whole winter, and makes this grass one of the greatest value to the western farmer. Jas. N. Brown, a very intelligent stock breeder and feeder in Illinois, assured me that he would prefer one hundred acres of Blue-grass for winter feed, to sixty acres of corn to the same cattle.

Poa compressa is the true Blue-grass, and was indeed so named. It is also called Flat stalked meadow-grass and wire-grass, on account of its firm and compressed culm, which when cut across, presents a diamond shaped section instead of the terete form of all the other species of this genus. This grass is found in hill pastures, and though not cultivated, indeed, little known or esteemed by our farmers, and affording less herbage than the *pratensis*, it is really a very superior pasture for sheep and cattle Where it has attracted the attention of observing agriculturists, it

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is highly appreciated, and one pound of this grass is said to produce an ounce of beef, to the graziers of Berks county, Pennsylvania. In Kelly's Island, Ohio, it forms a dense mat of grass, and the pastures are famous for producing the richest butter, and for supporting the work-oxen in good flesh without grain. The cattle on the Island are also remarkably free from disease of every kind.

The creeping stems or roots of this grass are very tenacious of life, they bind the soil together in a close mat, making a tough sod that is sometimes troublesome in arable land, particularly in wet seasons.

Like most of this genus of Poa, this grass has probably been introduced into our country, though Asa Gray, while admitting the foreign origin of this and the Kentucky Blue grass, says they are probably indigenous in New Hampshire and Vermont, and "to the northward."

Festuca elatior, Meadow Fescue or Fall Fescue, is a valuable grass, often found mixed with the Blue grass, on good soils. It has been extensively naturalized in the Middle and Northern States. Our native species of Festuca are of little value, and some are indicative of poor land.

Bromus secalinus, cheat, chess, is a foreign annual weed, that is extensively introduced in our wheat culture, to the great annoyance of good farmers, who often have to thank their neighbors for it, after having been at infinite pains to rid their farms of this nuisance, by carefully cleaning their seed wheat. Chess will often sow itself in the wheat stubble, making its appearance year after year, and ripening its seeds, even when nearly choked out by more valuable permanent grasses. These seeds have wonderful vitality, and appear at last as fully developed plants, whenever the circumstances are favorable, so that the ignorant farmer jumps to the conclusion that his wheat has turned to cheat, after having been frozen out during the winter, or when cattle have poached the ground and torn it out or eaten it off.

Among the humbugs of agriculture has been "Willard's Bromus," which was sold as a valuable grass. It proved to be nothing but this cheat, which thus deserved its name doubly. This may be cited as an argument in favor of the diffusion of botanical knowledge. The fact of its being called *Bromus*, should have put all upon their guard.

Cheat produces some pasture in the early spring, and yields a fair crop of coarse hay, but is inferior to many other grasses, and should never be cultivated. There is another introduced species, *Bromus racemosus*, or Upright Chess, but neither this nor the native species is of any value.

Those who collect grasses for winter bouquets will place cheat beside the *Uniola latifolia* and other graceful glumes to ornament their vases with waving tresses.

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Phragmites communis, the Reed, is common in marshes, where it furnishes coarse pasturage, growing from eight to twelve feet high.

Arundinaria macrosperma, or Cane, was in early times the resort of bisons, and on the first settlement of the country it furnished a green winter pasture of some value to the pioneers. It is generally found in rich, sandy bottoms, more or less subject to overflow. The smaller variety or perhaps species used to abound in the uplands of Kentucky and some other Western States, and is still often seen in cultivation in gardens. It was called the Virgin Cane, and its slender culms furnished pipe rods for the pioneer and his hardy wife through which to draw the soothing fumes of their home-grown tobacco—it may still be applied to a similar purpose, for ought I know, and by those perhaps who are ignorant and innocent of the toils of pioneer life of our *foregones* who may have needed its solace. The larger canes are not merely used by the idle angler, dallying with the finny tribes, but they are applied in the arts.

Lolium perenne, the Perennial Ray-grass or Rye-grass of Europe, affords abundant pasture by its long radical leaves in rich land. It is used in lawns. The Rye-grass, perhaps a variety of superior merit, has been distributed through the Patent-Office seed establishment, but it is seldom met with, being very little cultivated in this country. Virgil has rendered this grass classical by his reference to the "infelix Lolium," on account of the belief that the seeds were somewhat poisonous. He may have only shown us the ignorance of his times, for we now believe that the family of grasses is without a poisonous member, though diseased grains are sometimes unwholesome, as in the case of spurred-rye.

Triticum repens, or Couch grass, Witch-grass, is a plant of very different character and appearance from wheat, with which it is classified botanically. It is a perennial weed, introduced to some extent from Europe. The herbage is eaten by cattle, but it is a troublesome weed in cultivated land, and had better be avoided.

Arrhenatherum avenacum, Oat-grass, or grass of the Andes, is an European species, somewhat cultivated in this country. Mr. Flint speaks highly of it for its early, rapid and late growth, adapting it for pasture.

Holcus lenatus, Velvet-grass, Feather-grass, is naturalized in some parts of the country. It is not highly esteemed.

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erts a happy influence upon the character of the delicious butter for which the markets of that city are proverbial.

Phalaris arundinacea, or Reed Canary Grass, is a showy herb, but of little value for pasture or hay; it should be sown early. A variety grown in the gardens has striped leaves, and is known as Ribbon-grass. This peculiarity or sport is said to be lost when the grass is planted in wet soils.

P. Canariensis, or Canary Grass, is cultivated for its seed, the favorite food of our little singing bird. Though imported, this grain may be cultivated in this country. This species is annual.

Paspalum setaceum, springs up in our blue grass pastures in the latter portion of the season, and is perennial.

Panicum sanguinale, Crab-grass, Finger-grass, is annual, and a troublesome weed in cultivated uplands in the South, where, however, it is valued for hay. In this latitude it is somewhat troublesome in our vineyards and potato fields, making its appearance after cultivation has been discontinued for the season.

Panicum glabrum, Smooth Panicum, is another foreign annual weed, of prostrate habit, found in waste places.

Panicum Capillare, Old Witch-grass, is found in sandy pastures and cultivated grounds, flourishing in the end of the season. The panicles are large and widely branching, and when they break off they blow about and are collected against fences and hedges. When gathered young they are considered quite ornamental, and are frequently introduced into the grass bouquet.

Panicum Crus-galli, Barn-yard grass, is a coarse weed of little value, as it grows naturally, but Mr. Flint has recommended trials of this grass for hay, which he says is relished by cattle. There are about four hundred species of this grass, most of which are considered weeds.

Setaria glauca, Fox-tail, is well known as a succeedanium to wheat, growing in stubbles after harvest, and also in fields where the other grasses are thin. It is sometimes mown with the second crop of grass, but is not valuable.

Setaria viridis, Green Fox-tail or Bottle-grass, is from the south of Europe—not valuable. This looks more like millet, and is indeed quite ornamental.

Setaria italica, Millet, Bengal grass. Native of Europe and India; has been introduced as an annual hay and seed crop, yielding a large amount of good fodder. The seed is useful for poultry, and has been ground for calves. *S. verticillata* has interrupted heads.

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very worthless native grasses which make their appearance in old neglected farms, especially on light soils. They are often called Broom Sedge, and are characteristic of bad farming, and are said to have been introduced into our country by the thriftless emigrants from the South, who use the straw as a material for brooms. A new application of these worthless grasses has recently been made in the arts. The strong, elastic, fibrous roots are substituted for bristles in the manufacture of brushes.

The importance of the hay crop will be seen at a glance at the figures, being nearly twenty millions of tons, which, at only ten dollars per ton, makes an amount of two hundred millions dollars per annum.

The *Leguminosae*, or Bean Family, is exceedingly numerous, containing about four hundred genera, all characterized by a peculiar inflorescence, many having flowers of a butterfly shape, and all having fruits of a leguminose character. The plants, however, vary greatly in form, some being humble herbs, others twining herbs or shrubs, while some are majestic forest trees. So with their products, while some are highly nutritious, others are medicinal and some are poisonous. Hence we are able to subdivide this extensive group of plants.

Clover, *Trifolium pratense*, is one of the most valuable foliage plants. Though not a grass, it is extensively used as pasture, and for hay, both alone and mixed with grasses. Clover is not only highly nutritious for feeding cattle of all kinds, but it also feeds the land; sending its roots deeply into the soil, it brings up from below valuable elements of plant-growth that were not in the upper soil; it also spreads forth its hands, as it were, to the sky for aliment; its broad foliage attracts the dew, and also absorbs from the atmosphere nutritious gases that fertilize the soil; and at last, being generally a biennial plant, it dies, leaving a rich legacy to the land that bore it, in a large amount of decaying vegetable matter of a most enriching character. Clover should enter into every rotation of crops, for the sake of its meliorating influence. Since it is one of the best fertilizers, nothing so rapidly restores exhausted lands, and it is a hopeful sign to the farmer to find Red Clover becoming a weed in his fields.

This plant may be said to have been well naturalized in our

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The White Clover, or Dutch Clover, *Trifolium repens*, is quite a different plant. It has a creeping stem, which roots at every joint, so that the plant does not depend upon its tap-root exclusively, and by means of its accessory rootlets, it soon spreads over a considerable surface. The herbage is abundant, but rising only by the petiole, from the creeping stem, it never attains any great hight, so that this makes but a low forage plant, and it is not sown in meadow lands, but in pastures, where, however, it is so completely naturalized that it frequently takes possession of the land, without any effort on the part of the cultivator. There is, indeed, a question among naturalists whether the White Clover be not a native of both continents.

The bee-pasture of this plant is excellent, the honey is very light colored and deliciously well flavored, nor do the common bees appear to have experienced any difficulty in reaching it.

There are other species of clover of less value. *T. reflexum* and *T. Stoloniferum* are the Buffalo clovers, natives of this region, but not valuable. The Crimson clover, annual.

Melilotus alba, Melilot or French clover, has been naturalized about old gardens. It has a peculiar racy fragrance, which is hightened on wilting, and this plant is said to be the material from which the green cheese, sap-sago, or *Schabzieger* of the Swiss, derives its peculiar flavor. How valuable soever it may be as a forage plant on the Alpine hights, the Melilotus is not likely to find much favor in the eyes of our American agriculturists.

Medicago sativa, Lucerne, Alfafa clover, has been used for soiling, but it has never been fairly introduced into our agriculture. It is not a pasture plant, so much as one appropriate for *soiling*. In Europe and in Mexico, and on the Andes, in South America, it has been used to some extent, and its value consists in its luxuriance and that it may be cut several times in a year. The plant, too, is perennial, and its long tap-roots descend very deeply, so that in dry, gravelly, rocky and chalky lands it thrives from year to year.

Cicer arietinum is the Chick-pea of Europe, the gram of India, where it is used as horse feed, the *Hamoos pea* of the Arabs, according to Lynch of the Dead Sea expedition. That explorer brought it home as a novelty, though known since the days of Homer. It was distributed by the Patent Office in 1854, but soon fell into disrepute; recently, however, it has again been heralded as a valuable acquisition upon the prairies under the name of *Illinois coffee*, or "Australian coffee." The seeds have been used as a substitute for that acceptable beverage, which is now becoming a luxury for the rich, instead of the poor man's necessity, as it has been in this country for the last half century.

Arachis hypogaea, Pea-nut, Ground-nut, is a South American plant of this family, largely introduced into our Southern States as an article of food. Few persons are aware of the curious habits

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of this plant, and that while its flowers are aeriel its seeds are subterranean, as indicated by its name, hypo-gaea, *under the earth.*

The *Faba vulgaris*, or common Horse-bean or Windsor Bean, is a coarse legume, with a strong flavor, though sometimes brought to table. It is cultivated in Europe for feeding horses.

The Lupins, *Lupinus lutens* and others have been recommended as fertilizers, to be plowed in, for poor sandy soils. V. P. O. Rep. 8161.

Ervum lens, the Lentil, is cultivated in the Old World as food for stock, both herbage and seeds being used. The latter may, when properly cooked, be eaten as a substitute for beans.

Pisum sativum, the common garden pea, is familiar to all gardens, where it is produced for the delicious vegetable known as green peas. In the northern portions of the country it is considerably planted as a field crop, for stock feeding, and to sell to us to adulterate our coffee—in which manner much more is used than coffee-drinkers might wish to know. Horticulturists have perfected the culture of this plant to such an extent that there are almost endless varieties. The profuse vegetation rapidly produced, would seem to indicate the pea for a fertilizer, and in the Southern States the Cow-pea is largely used for this purpose. With us this plant has been recommended as a mulch for raspberries, sown between the rows after the spring plowing, and allowed to fall and rot upon the surface. In an adjoining county it used to be the practice with some farmers to sow a field of peas for hog pasture in the early part of the season.

Vicia sativa, the common vetch or tare, is cultivated in Europe for cattle. It has been distributed by the Patent Office, but has never met with any favor among our agriculturists.

Phaseolus vulgaris, the common bean, Kidney Bean, Pole Bean, of sorts, is a native of India, much used as an article of diet, both green and dry.

P. Nanus is the dwarf or bunch bean.

P. Lunatus, the Lima and Carolina bean, is believed to be a native of Bengal; is a delicious vegetable, winter and summer.

Rosaceae, are a large family group, embracing about sixty genera and five hundred and seventy species. This order is sub-divided into four sub-orders, *Roseae*, Pomeae, Persicae, Sorbeae—among them we find the queen of flowers, and also some of our choicest fruits—especially those that have kindly yielded to the civilizing in-

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There is nothing more grateful than the early strawberry, nothing more wholesome than this fruit, eaten fresh as picked, or with a little sugar added to each plump berry as it passes to the mouth. Stale fruit, wilted with sugar and then smothered with cream, may be a dish to set before a king, a president, or even an American "sovereign," the denizen of some crowded city; but the sovereign who is monarch of all he surveys, be it but a strawberry patch of a single rod square, will tell you that the berries never taste half so well as they do fresh in the patch, cooled with the summer dew, at early morn.

There are several species of strawberry, from different portions of the globe, and of the cultivated varieties the assortment is numerous, every year producing some novelties of greater or less merit. The horticulturists of the region where I reside have obtained a world-wide notoriety for the firmness with which they have advocated a correct botanical history of this plant, and the abundant supplies in the markets have demonstrated the truth of their dogmas. New methods of culture are now obtaining favor, and the produce secured is immense; the success depends upon checking the stem growth and enabling the fruit growth to monopolize the force of the plant.

The genus *Rubus* or Bramble is divided into those which have a hemispherical fruit that separates from the receptacle when ripe, and those in which the carpels, being persistently attached to the receptacle, form an oblong fruit. The former are raspberries, and the latter blackberries—of each there are many species and varieties. The European raspberries are believed to be *Rubus idaeus*, the Antwerp class; the Americans are either *R. Strigosus*, the red berries, or *Occidentalis*, the Black-cap; the latter are characterized by their making spontaneous layers, the tips of their long branches taking root when they come in contact with the ground.

Of Blackberries, *Rubus canadensis*, is the trailing or Dewberry, R. villosus, the upright bush or true Blackberry. There are several varieties, differing in the color of the fruit.

In the tribe *Pomeae*, the Pear family, are the Pear and Apple, *Pyrus Crategus* or thorn, *Cydonia*, etc.

The Pear is *Pyrus communis*, a most delicious fruit after it has been long subjected to cultivation, but in its wild state inedible. Our catalogues abound in numerous varieties of this excellent fruit, which, from its natural period in ripening, September, has been made to perfect its fruit from June until April, and even to be had the year round.

The *Pyrus malus* or Apple furnishes a similar result of the civilized care of man. Like the pear, its varieties are exceedingly numerous, and whole books are required to describe those that are worthy of cultivation. They all come from the wild crab of Europe.

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Our American crab is, however, quite a different species; it is the *Pyrus coronaria*, desirable chiefly for its lovely flowers, and its acerb but very fragrant fruit, that is sometimes used for preserving.

The Siberian crabs, *Pyrus baccata*, are ornamental in fruit and used for preserving.

The *Pyrus Americana*, or Mountain Ash, is simply ornamental, with its scarlet berries.

The Quince is *Cydonia vulgaris*, a plant that furnishes us with food in the delicious preserves that are made from it, but is scarcely edible in its native state, it requires the human fine-art of cookery to make it palatable. The Quince is a native of Southern Europe, and is reputed to be the fabled "Golden Apple of the Hesperides." A very rich cider has been made from this fruit.

The Thorn, *Crategus*, would not be expected among the Food-plants, and yet what boy has not reveled among the crimson Haws, which he will tell you are as good as apples, though the fruit consists chiefly of horney seeds covered with a scanty flesh of pericarp. Swine and poultry consume these fruits in large numbers, and with advantage. The *hyps* of roses also are eaten, and they are immortalized in English verse.

The *Cruciferae*, or Cross-bearers, are so called because the flower leaves are four in number and so arranged that one pair is always at right angles with the other, crossing. This is so marked a character in all of the family that it is palpable to a child, and as many of the plants are in common cultivation this order is one of the first that is learned. Besides, the sensible properties of all are the same, being somewhat pungent, they all contain sulphur, which is detected by the effect of mustard upon a silver spoon, and by the peculiar odor of boiling turnips and cabbages. This is sometimes called the *mustard* and the *cabbage* family.

Nasturtium officinale is the water-cress of England, an aquatic plant, not the same as that you call *Nasturtion*, the *Tropaeolium majus*, which belongs to a very different family, but which having sensible properties like the water-cress, has received the same name in common parlance; the meaning of this word is from the latin *nasus tortus*, tortured nose, from the pungency. The water-cress, like all of the group, is antiscorbutic, and makes a good salad. In ditches, and streams fed by springs, so that the water does not freeze, it grows all winter. It is introduced into some parts of the

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often found on old garden sites, naturalized. This plant is eminently antiscorbutic, eaten as a salad, but it is coarse and pungent.

Lepidium sativum, *L.*, the common cress, is much used for salads; it is very delicate and spicy, and generally known as Pepper-grass or Tongue-grass. *L. virginicum*, or wild Pepper-grass, common on uplands, a weed of little injury.

The *Asymbrium officinale*, or Hedge Mustard is a weed, but the young shoots and radical leaves are used as greens in the country.

The genus *Brassica* embraces Turnips and Cabbages, such as Bore-Cole, Savoy, Head Cabbage, Kohl-Rabi, Cauliflower and Brocoli. All of these are cabbages, *Brassiea Oleracea*. They are rather varieties and spouts resulting from long cultivation, than species, and they are all prone to mix by cross-breeding, not hybridizing, hence it is very important for the gardener to allow but one kind to produce seed in one place. All of these varieties, many of which are delicious and highly nutritious vegetables, have been derived from a small unattractive and pungent weed growing on the shores of Northern Europe. The folding together of the leaves, etiolates them and diminishes their pungency, hence we have the mild salad (cold slaw) from the cabbage head, the exquisite morceau from the succulent shoots and flowerbuds of the cauliflower and broccoli, the delicate marrow of the rapidly produced thickened stem of the kohl-rabi, which must be eaten before its greater maturity has developed the strong flavor and tough woody fibres.

Brassica campestris, or Turnip, also shows the effects of long cultivation, in its many varieties, some of which, in shape, color, and foliage, are very dissimilar, as the Ruta-baga, and the Flat Dutch varieties. They all come from the wild plant, which grows everywhere, from the Baltic to the Caucasus. Most turnips are cultivated for their roots, but the *var. oleifera* is largely grown in Europe for its seeds, from which a very superior oil is prepared. The Colza oil is used for burning in Light-houses, and for other purposes.

Sinapis alba, the largest seeded or White Mustard, the *S. nigra*, the common or Black Mustard, are both cultivated in gardens, for their radical leaves, which are used as greens, and for their seeds that are condiments. The Black Mustard, especially, has become naturalized in this country, though both species are natives of Europe.

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of using it; the rapily developed fleshy root is the favorite portion; from this the too radical leaves may be used as greens, if scalded or boiled.

The *Convolvulaceae*, or Bindweed family, gives us the Chinese Yam, about which we have heard so much, and the Sweet Potato, the highly nutritious tuber of the *Convolvulus batatas*, a native, as is supposed, of tropical America, but not found wild. The Sweet Potato never flowers in this latitude, but is altogether propagated by offsets and cuttings. This plant is called *Batatas edulis* by Choisy, the French botanist. Our word Potato is supposed to be a corruption of the Indian word Batatas, and is applied to a very different plant, to be named.

The *Solanaceae* are an order of widely different characters. As a rule they are poisonous, yet we have among them the invaluable esculent Potato, giving its name to the family, the *inevitable* Tomoto, and other food plants.

Lycopersicum esculentum, the Tomato or Love-apple, is annual, a native of Spanish America. After the revolution in St. Domingo, many French families came to Philadelphia, where they introduced their favorite Pomme d'Amour. With them long remained the privilege of its enjoyment, and I can well remember when it was considered a remarkable taste to like Tomatoes; now this excellent vegetable is universally cultivated, and it has undergone quite an improvement in quality as well as increased in variety under cultivation.

The genus *Solanum* embraces the *S. Nigra*, or Nightshade, a poison; *S. Dulcamara*, the Bitter-sweet, of doubtful reputation; the *S. Tuberosum*; our valuable esculent, *S. Esculentum*, or Egg-plant, and *S. Carolinense*, Horse-nettle or Wild Potato, a miserable weed, difficult to extirpate, because of its deep root. The Potato is a native of Central and South America, where the tubers are small and not richly amyaceous as they become under the influence of high cultivation; the plant is somewhat poisonous, but whatever of evil there may be in the roots it is dissipated by cooking.

The Potato was introduced into Ireland in 1610, and into Scotland only in 1728, not generally till the middle of the 18th century. It is now almost universally cultivated. U. S., 1860, 110.571.201 bushels.

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ipe fruit has a somewhat pleasant flavor, and is used, though not omparable to the luscious offerings which Pomona makes at the ame season. The Ground Cherry has been exhibited at the agri-ultural fairs as the "Cape Gooseberry," and seeds sold at fancy rices.

Daturi, *Hiosciamus*, *Nicotianum*, all belong to the Potato family, nd all are poisonous.

The Jamestown weed was introduced into Europe from Arabia y quack doctors, and by the cavaliers to Virginia, in America, ence the name *Jamestown*, the early settlement on the James ver.

The Goose-foot family, *Chenopodiaceae*, contains the garden beet, *eta vulgaris*, of which there are several varieties of cultivation, naracterized by color, shape and uses. The larger kind are used i food for cattle, the sugar beet for sugar making, and others as iculents for man. The leaves may be used as a pot herb.

Spinacia oleracia, or Spinach, is a native of the East, and was sed by the Arabs. This is a favorite greens, and cultivated in ie gardens for that purpose, being very mucilaginous and without ıy disagreeable taste.

Orach, or *Artriplex hortensis*, is of this family.

Chenopodium album, or Lamb's Quarters, is a common weed, aturalized from Europe, found in rich soils. The young plants e often used as greens, but are not equal to Spinach.

The nearly allied family of *Phytolaccaceae* contains the Poke-eed, *Phytolacca decandra*, which, though emetic and purgative its roots, yields us a good substitute for Asparagus in its young anched shoots, early in the spring.

In the *Liliaceae* we find the *Asparagus officinalis*, which, though native of estuaries on the coast of Europe, is now found in every ıod garden, where it wants a rich, deeply worked soil and plenty manure to bring it to perfection. This is the most valuable and althful of all the vernal pot-herbs, exerting a constitutional effect i those who consume it that is very useful.

Among the beautiful and sweet-scented flowers of the Lily family, e find also the odorous Onion and Garlics. The former, *Allium pa*, the native country of which is unknown, is cultivated in every rden, and is grown in some parts of the country in considerable elds. It is used on sea-voyages as an antiscorbutic. On account its odor it is taboed from "good society," and yet, who does not ke a *silver-skin*, boiled in milk, or the fragmentary inklings that

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Allium porrum, or Leek, is the favorite pot-herb of the Welchman; Gay says, "Leeks to the Welch." It is used in cookery.

Allium schoenprasum, is commonly called Chives or Cives, and *A. Scalonicum*, or Shallots, are cultivated as culinary herbs; as also is the Garlic, *A. Sativum*, particularly by the Spanish.

Another Garlic, *A. Vineate*, or field Garlic, so abundant in some portions of the country as to injure wheat, and to ruin the milk and butter, from the pastures where it abounds, was introduced from Europe. According to different authorities, the Welch, (with propensities avowed for Leeks,) and the Swedish settlers upon the Delaware, divide the honor of having introduced this abominable weed, for the sake of its early pasturage. Truly with the ancient bard we may exclaim,

"de gustibus non disputandum est!"

The *Compositae* are a large order, furnishing food plants, in moderate numbers, and comparatively little importance.

Cynara scolymus, is the Garden Artichoke, which looks like a great coarse thistle. The bases of the fleshy scales of the flower-head are eaten as a middle coarse at dinner. A similar plant is the Cardoon, the leaf-stems of which are eaten after being blanched.

Chicorium intybees, Chicory, or Succory, is well known as a proposed substitute for coffee. This root is much cultivated in Europe for the purpose.

C. endivia, is a coarse kind of Lettuce, called Endive. It has so much of the bitter principle hactucarium that it is not eaten until the younger leaves are etiolated or blanched artificially.

Taraxacum leontodon, or Dandelion, a very common weed, with reputed medicinal properties, is used in the country as a spring salad, though rather coarse and bitter. This is a foreigner with poetic associations,

"We twa hae run about the braes,
And pu'd the Gowans fine,
But we hae wandered mony a weary foot,
Sin Auld Lang Syne."

Lactuca sativa, the garden Lettuce, is the prince of salads, and furnishes our tables with this healthful food for six months in the year. Highly cultivated, it is rich and nutritious, especially when young, or headed, when the narcotic principle, *lactucarium*, is not yet developed.

Tragopagon porrifolium, or Salsify of our gardens, yields a mucilaginous root, generally called Oyster Plant.

The *Umbelliferae* constitute a large and important order, com-

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The *Daucus carota*, or Wild Carrot, and *D. c. sativa* is a native of the East. In some of the older States it has become naturalized as a very troublesome weed. The variety *sativa* is the garden vegetable, highly esteemed for the abundant yield of its large fleshy roots, which are not merely useful in the kitchen as an addendum to soups and hashes, but which are highly valued as cattle food. The Carrot contains a substance called *pepsin*, which aids digestion of other food.

Pastir aea sativa,* is the Parsnip, which in the garden furnishes a valuable esculent root, useful for man and for stock. The root may be left in the ground all winter, and being very nutritious for swine, these animals may be allowed to help themselves. When neglected a few years, and allowed to grow without cultivation, the parsnip degenerates to a wild state, and becomes a troublesome weed, the foliage of which is very poisonous to some persons.

There are also two plants known by the name of Cow Parsnip, *Heracleum lanatum*, and the *Archemora rigida*, or Cow-bane, Wild Parsnip. Both are somewhat poisonous, and should be eradicated. They grow on rich, low grounds and swampy meadows.

The *Foeniculum vulgare* is the Fennel, a very aromatic plant, with foliage very finely cut. All parts are aromatic, but the seeds are used as a condiment in cooking.

Carum carui yields the aromatic seeds called Carroway, which are used in cookery.

Apium gravesiens, or Celery, is highly and agreeably aromatic, used in cookery, both foliage, roots and seeds. Its chief value, however, is as a salad, for which purpose it has to be etiolated, which causes the sharp flavor to be modified, and we have a sweet, spicy and delicious tender salad. The variety, *rapeum*, or turnip-rooted, is for cooking.

Apum putroselinum, or Parsley, is a well known and highly esteemed condiment in cookery, also used as a garnish on account of its pretty leaves. The variety *crispum*, or curled Parsley, is quite ornamental. This should be in all gardens. Parsley has been recommended to be mixed with grasses for sheep pastures.

The *Cicuta maculata*, Water Hemlock, native, and the *Conium maculatum*, Poison Hemlock, introduced from Europe, are both of them poisonous, and should be known that they may be avoided.

Coriandrum sativune, is cultivated to some extent for its aromatic Coriander seeds. The odor of the herb is very offensive. The very name indicates bed-bug, (Koris) and yet the Tartars make from it their favorite soup.

The family of *Cucurbitaceae*, or Squashes and Melons, is interesting to the agriculturist, though it contains some plants that are medicinally active or even poisonous. The *Lagenaria vulgaris* is the common Gourd, a tropical plant. The fruit has a firm rind, and, growing to a convenient shape, the Gourds are much used for

*Farm pasture food.

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dippers, drinking cups, bottles and boxes, particularly in the South, and the word *gourd* has become the generic word there for any drinking cup such as Yankee ingenuity has abundantly provided from cocoa-nut shells, etc.

The green fruit is eatable, and one variety, *clavata*, or club-shaped, or vegetable marrow, which is very long, and used to some extent for this purpose. It is cut into slices and fried like egg-plant.

The *Cucumis melo* is our favorite Canteloupe melon, with its varieties, some of which are delicious as fruits, also used for pickles in their green state.

Cucumis sativus, is the Cucumber, a native of the East—is universally cultivated and used as a refreshing salad, sliced with vinegar—the older fruits may be stewed, and the younger are used for pickles.

Citrullus vulgaris is the Water-melon, a native of India and Africa, but universally cultivated, preferring warm, sandy soil. The fruit is wholesome and sweet. Molasses has been made from the juice.

Cucurbita pepo, is the Squash and Pumpkin, of which we have numberless varieties, all more or less valuable as food for man and cattle. The celebrated pumpkin-pie is an essential element of thanksgiving dinners.

The Plymouth Fathers, when cast upon the inhospitable shores of New England, would have suffered starvation but for the pumpkins and Indian corn that were furnished by the natives. Both plants of tropical origin.

The *Grossulaceae* or Currant tribe furnishes us the Gooseberries and Currants that are all embraced in one genus. *Ribes uva-crispa*, with prickly stems, is the Gooseberry; *Ribes nigrum* and *R. rubrum* are the Black and Red Currants. These small fruits are highly valued for their healthful characters. They are eaten raw and cooked in various ways.

The *Vitaceae* or Vine family, embraces the grapes, both foreign and native. The value of this fruit is proverbial, and is cultivated wherever it can be made to grow. I need not detain you with any lengthened description of this delicious fruit, which, in its varieties and modes of culture has been fully described by this Society.

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In Paris the use of coffee was introduced in 1643, but the enterprise of a coffee saloon was a failure. Mad. Levigne attempted to write down the use of the beverage, which she prophesied would not permanently gain the affections of the people.

Coffee houses were introduced into London about the middle of the seventeenth century, and were numerous when put down by Cromwell, who preferred the ale-houses.

In 1810, a plant was cultivated in the royal gardens at Amsterdam, from which a stock was sent to Louis XIV, and put into the Jardin des Plants.

In 1720, Antone de Jussim sent three plants to Martinique, one of which survived the voyage, and from this all American coffee has descended. In 1754, one plant was taken to Brazil, in a convent garden in Rio de Janeiro, from this have sprung the immense coffee plantations of that country, from which the United States annually draw more than one hundred and eighty millions of pounds.

The coffee crop of Brazil is worth twenty times as much as the diamonds of that country.

Numerous tropical plants furnish food, and they are very productive. Among these are the Bread-fruit, Cow Tree, Palms, Cocoa-nuts, Dates and Oranges, all contributing to the wants of man in the heated regions of the world, where they are mostly spontaneous and require little care.

These, with the Rosacean fruits and the nuts of the temperate zones, comprise all the aborescent plants that yield food.

It is remarkable that most food is produced by annual and herbaceous plants. Even the Banana of the tropics is herbaceous. This remarkable vegetable produces more human food on a given space than any other plant; an acre is said to furnish food enough for fifty men. This is not much to be wondered at when we consider that each bunch contains from 150 to 180 fruits and weighs from 70 to 80 pounds. The ground required to produce 1,0 0 pounds of potatoes will produce in less time 44,000 pounds of the banana. A surface sown in wheat, sufficient to last one man, if planted with bananas, will support twenty-five persons. It is no wonder that this prolific vegetation, and with the relaxing influence of a tropical climate the natives of such countries should be enervated and indolent. They have no incentive to active exertions. Do we envy them their easy lot? Ah no! The inhabitants of the temperate zones must *work to live;* but honest labor ever brings its rich rewards. Let us rather rejoice that our lot has been cast in such a region of the earth where the moral and physical

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TRANSACTIONS

OF THE

ILLINOIS STATE HORTICULTURAL SOCIETY,

AT ITS

ANNUAL MEETING,

HELD AT NORMAL, DEC. 6, 7, 8 AND 9, 1864.

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OFFICERS FOR 1865.

PRESIDENT.

JOHN P. REYNOLDS, Springfield, Sangamon County.

VICE PRESIDENT AT LARGE.

O. B. GALUSHA, Lisbon, Kendall County.

VICE PRESIDENTS.

1st	District—	JONATHAN PEKIAM	Thornton Station, Cook county.
2d	"	C. N. ANDREWS	Rockford, Winnebago county.
3d	"	A. R. WHITNEY	Franklin Grove, Lee county.
4th	"	TYLER MCWHORTER	Millersburg, Mercer county.
5th	"	ARTHUR BRYANT, SR	Princeton, Bureau county.
6th	"	ELMER BALDWIN	Farm Ridge, LaSalle county.
7th	"	C. L. PATE	Catlin, Vermilion county.
8th	"	O. M. COLMAN	Bloomington, McLean county.
9th	"	C. C. STURTEVANT	Beardstown, Cass county.
10th	"	ISAAC SNEDECKER	Jerseyville, Jersey county.
11th	"	WM. L. WRIGHT	Kinmundy, Marion county.
12th	"	B. F. LONG	Alton, Madison county.
13th	"	SETH R. JONES	Carbondale, Jackson county.

CORRESPONDING AND RECORDING SECRETARY.

W. C. FLAGG ..... Alton, Madison county.

ASSISTANT SECRETARY.

JOHN M. PEARSON ..... Alton, Madison county.

TREASURER.

S. G. MINKLER ..... Specie Grove, Kendall county.

EXECUTIVE COMMITTEE.

JOHN P. REYNOLDS, SMILEY SHEPHERD G. W. MINIER.

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STANDING COMMITTEES, 1865.

The gentlemen named upon the committees are respectfully requested to act and report separately for their respective parts of the State.

Northern.	*Central.*	*Southern.*
METEOROLOGY.		
Jas. W. Tolman, Winnebago.	John Grant, Manchester.	J. Ellsworth, Hoyleton.
GEOLOGY AND SOILS.		
C. N. Andrews, Rockford.	C. D. Wilber, Bloomington.	Henry Engelmann, Belleville.
BOTANY AND VEGETABLE PHYSIOLOGY.		
Geo. Vasey, Ringwood.	E. Hall, Athens.	Theo. Engelmann, Mascoutah.
ORNITHOLOGY.		
E. A. Clifford, Evanston.	R. H. Holder, Bloomington.	Parker Earle, South Pass.
ENTOMOLOGY.		
Dr. B. D. Walsh, Rock Island.	J. A. Sewall, Normal.	Frank Starr, Alton.
FRUIT CATALOGUES.		
Arthur Bryant, sr., Princeton.	C. R. Overman, Bloomington.	E. S. Hull, Alton.
ORCHARDS AND VINEYARDS.		
C. W. Murtfeldt, Rockford.	N. W. Bliss, Warsaw.	N. C. Meeker, Dongola.
ORNAMENTAL AND TIMBER PLANTATIONS.		
O. B. Gallusha, Lisbon.	G. W. Minier, Mackinaw.	Jon. Huggins, Woodburn.

COMMITTEE OF CORRESPONDENCE.

The following gentlemen are requested to co-operate with the Corresponding Secretary in collecting and communicating facts of interest to the Society, and in disseminating the information and extending the influence of the Society:

Name.	*Post Office.*	*County.*
J. H. Stewart	Quincy	Adams.
C. T. Chase	Cairo	Alexander.
W. S. Wait	Greenville	Bond.
Geo. Chaffee	Belvidere	Boone.
A. McPhail	Mt. Sterling	Brown.
Verry Aldrich	Tiskilwa	Bureau.
B. F. Child	Hardin	Calhoun.
David Long	Mt. Carroll	Carroll.
C. C. Sturtevant	Beardstown	Cass.
M. L. Dunlap	Champaign	Champaign.
W. A. Chase	Rosamund	Christian.
B. Sweet	Melrose	Clark.
C. Chaney	Flora	Clay.
O. B. Nichols	Carlyle	Clinton.
J. H. Wooley	Mattoon	Coles.
Jonathan Periam	Thornton Station	Cook.
David Templeton	Palestine	Crawford.
E. Jennings	Neoga	Cumberland.

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Name.	*Post Office.*	*County.*
S. W. Arnold	Cortland	De Kalb.
Wm. Smith	Clinton	De Witt.
I. J. Hulsted	Tuscola	Douglas.
Lewis Ellsworth	Naperville	DuPage.
B. O. Curtis	Paris	Edgar.
J. B. Orange	Albion	Edwards.
Elijah Henry	Mason	Effingham.
D. F. Jerrold	Vandalia	Fayette.
D. S. Crandall	Paxton	Ford.
Geo. Hamilton	Ewing	Franklin.
D. T. Emery	Canton	Fulton.
J. G. Hall	Shawneetown	Gallatin.
A. C. Hinton	Carrollton	Greene.
Geo. Fisher	Morris	Grundy.
H. Vice	McLeansboro	Hamilton.
J. R. Toll	Pontoosuc	Hancock.
J. B. Turner	Elizabeth	Hardin.
W. L. Stockton	Oquawka	Henderson.
O. J. Stough	Geneseo	Henry.
J. B. Clark	Onarga	Iroquois.
F. Evans	Makanda	Jackson.
F. L. Jones	Newton	Jasper.
J. S. Galbraith	Mt. Vernon	Jefferson.
Isaac Snedecker	Jerseyville	Jersey.
Jas. G. Soulard	Galena	Jo Daviess.
W. E. Scarsdale	Cedar Bluff	Johnson.
D. C. Scofield	Elgin	Kane.
E. A. Sizer	Kankakee	Kankakee.
S. G. Minkler	Specie Grove	Kendall.
C. W. Huff	Galesburg	Knox.
Robt. Douglass	Waukegan	Lake.
E. Baldwin	Farm Ridge	LaSalle.
A. Shaw	Lawrenceville	Lawrence.
A. R. Whitney	Franklin Grove	Lee.
A. J. Cropsey	Fairbury	Livingston.
Jabez Capps	Mt. Pulaski	Logan.
A. W. Cooper	Decatur	Macon.
Jonathan Huggins	Woodburn	Macoupin.
B. F. Long	Alton	Madison.
A. P. Crosby	Centralia	Marion.
D. B. Weir	Lacon	Marshall.
J. Andrews	Mason City	Mason.
Wm. M. Bean	Metropolis	Massac.
J. Cunningham	Prairie City	McDonough.
James Crow	Crystal Lake	McHenry.
F. K. Phœnix	Bloomington	McLean.
John Hill	Petersburg	Menard.
Tyler McWhorter	Millersburg	Mercer.
Chas. Henckler	Waterloo	Monroe.
Burrell Phillips	Hillsboro	Montgomery.
J. B. Turner	Jacksonville	Morgan.
Samuel Campbell	Sullivan	Moultrie.
W. P. Flagg	Lane	Ogle.
B. L. T. Courland	Peoria	Peoria.
H. P. Brashaw	DuQuoin	Perry.
Chas. H. Harris	Monticello	Piatt.
E. V. Rice	Pittsfield	Pike.
Louis L. Koch	Golconda	Pope.
J. H. Crain	Undulation	Pulaski.
Smiley Shepherd	Hennepin	Putnam.
Wm. M. Jeffrey	Jones Creek	Randolph.
Geo. Mason	Parkersburg	Richland.
A. S. Coe	Port Byron	Rock Island.
Chas. Burnett	Raleigh	Saline.
Lucius C. Francis	Springfield	Sangamon.
R. M. Haskinson	Rushville	Schuyler.
Wm. Leighton	Winchester	Scott.
J. B. Reeve	Shelbyville	Shelby.
Wm. H. Butler	Toulon	Stark.
Theodore Engelmann	Mascoutah	St. Clair.

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Name.	*Post Office.*	*County.*
Luman Montague	Lena	Stephenson.
G. W. Minier	Mackinaw	Tazewell.
Adam Buck	South Pass	Union.
C. L. Pate	Catlin	Vermilion.
J. P. Geisler	Meier	Wabash.
Jas. G. Madden	Monmouth	Warren.
J. M. Hunter	Ashley	Washington.
G. W. Wickersham	Home	Wayne.
R. S. Graham	Carmi	White.
L. S. Pennington	Sterling	Whiteside.
W F. Nelson	Wilmington	Will.
John H. White	Marion	Williamson.
Chas. W. Murtfeldt	Rockford	Winnebago.
John G. Zeller	Spring Bay	Woodford.

MEMBERS, 1865.

Name.	*Post Office.*	*County.*
C. N. Andrews	Rockford	Winnebago.
H. A. Ainsworth	Geneseo	Henry.
A. Bryant, sr	Princeton	Bureau.
E. Baldwin	Farm Ridge	LaSalle.
E. Beaumont	Bloomington	McLean.
E. E. Bacon	Willow Creek	Lee.
J. P. Brubacher	Nachusa	Lee.
D. E. Brown	Alton	Madison.
C. C. Burroughs	Decatur	Macon.
J. G. Brown	Godfrey	Madison.
E. B. Bierce	Springfield	Sangamon.
T. L. Bacon	Rosamund	Christian.
J. J. Bubach	Princeton	Bureau.
D. Blodget	Brighton	Macoupin.
N. W. Bliss	Warsaw	Hancock.
E. A. Clifford	Evanston	Cook.
B. O. Curtis	Paris	Edgar.
H. Claggett	St. Louis, Mo	
J. B. Clark	Onarga	Iroquois.
B. C. Church	Odell	Livingston.
O. M. Colman	Bloomington	McLean
W. Colwell	Sparta	Randolph.
A. J. Cropsey	Fairbury	Livingston.
Z. Colman	Ottawa	LaSalle.
E. Cover	Makanda	Jackson.
John A. Cook	Pavilion	Kendall.
D. F. Cleveland	Springfield	Sangamon.
A. W. Cooper	Decatur	Macon.
W. A. Chase	Rosamund	Christian.
A. P. Cresby	Centralia	Marion.
V. K. Deyo	Makanda	Jackson.
M. L. Dunlap	Champaign	Champaign.
E. Daggy	Tuscola	Douglas.
A. P. Dysart	Nachusa	Lee.
W. Durley	Hennepin	Putnam.
J. Dougherty	Jonesboro	Union.
E. Daniels	Chicago	Cook.
R. Douglass	Waukegan	Lake.
Richard Edwards	Bloomington	McLean.
D. F. Emery	Canton	Fulton.
T. J. Evans	South Pass	Union.
P. Eisenmayer	Mascoutah	St. Clair.
H. D. Emery	Chicago	Cook.
H. Engelmann	Springfield	Sangamon.
Wm. Evans	Peru	LaSalle.
F. Evans	Makanda	Jackson.
Sam'l Edwards	LaMoille	Bureau.
E. P. Forbes	Seneca	LaSalle.

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Name.	*Post Office.*	*County.*
W. C. Flagg	Alton	Madison.
Suel Foster	Muscatine, Iowa.	
C. E. Fell	Bloomington	McLean.
T. L. Faulkner	Henry	Marshall.
L. C. Francis	Springfield	Sangamon.
W. P. Flagg	Lane	Ogle.
R. H. Fell	Bloomington	McLean.
J. W. Fell	Normal	McLean.
E. Frost	Godfrey	Madison.
C. B. French	Granville	Putnam.
O. B. Galusha.	Lisbon	Kendall.
Geo. C. Gaylord	Lisbon	Kendall.
A. Gross	Springfield	Sangamon
E. S. Hull	Alton	Madison.
H. D. Hester	Galesburg	Knox.
J. Huggins	Woodburn	Macoupin.
J. W. Haggard	Bloomington	McLean.
W. H. Hansen	Franklin Grove	Lee.
John Holt	Rock Island	Rock Island.
A. C. Hammond	Warsaw	Hancock.
George W. Hewitt	Foreston	Ogle.
C. I. Horsman	Rockford	Winnebago.
George Hinshaw	Bloomington	McLean.
Norman Hawks	Polo	Ogle.
G. D. Henderson	Granville	Putnam.
E. F. Hinman	Granville	Putnam.
George Husmann	Hermann, Mo	
O. W. Hoff	Galesburg	Knox.
L. Hutchinson	Seneca	LaSalle.
L. & L. C. Jones	Carbondale	Jackson.
G. E. Johnson	Peoria	Peoria.
J. M. Jourdan	St. Louis, Mo	
D. F. Kinney	Rock Island	Rock Island.
Amasa Kennicott	The Grove	Cook.
B. T. Kingsbury	Alton	Madison.
S. L. Kelsey	Bloomington	McLean.
W. E. Lukens	Sterling	Whiteside.
David Long	Mt. Carroll	Carroll.
H. B. Leeper	Normal	McLean.
B. F. Long	Alton	Madison.
Benj. Linton	Richview	Washington.
I. A. Lapham	Milwaukie, Wis	
G. W. Minier	Mackinaw	Tazewell.
S. G. Minkler	Specie Grove	Kendall.
Tyler McWhorter	Millersburg	Mercer.
E. S. Mygatt	Bloomfield, Wis	
H. T. Mudd	St. Louis, Mo	
W. H. Mann	Normal	McLean.
H. H. Marsh	Chicago	Cook.
Oliver Marcey	Evanston	Cook.
C. W. Murtfeldt	Rockford	Winnebago.
Geo. D. Martin	Cincinnati, O	
W. F. Nelson	Wilmington	Will.
A. N. Nevin	Chenoa	McLean.
C. R. Overman	Normal	McLean.
W. A. Pennell	Granville	Putnam.
J. M. Pearson	Alton	Madison.
Wm. Patton	Hennepin	Putnam.
C. L. Pate	Catlin	Vermilion.
W. P. Pierson	Onarga	Iroquois.
James A. Patton	Florid	Putnam.
A. S. Redfield	Alton	Madison.
W. D. Robinson	Henry	Marshall.
Isaiah Richmond	Geneseo	Henry.
John P. Reynolds	Springfield	Sangamon.
C. H. Rosenstiel	Freeport	Stephenson.
S. Redfield	Alton	Madison.
B. G. Roots	Tamaroa	Perry.
Daniel Read	Upper Alton	Madison.
O. J. Stough	Geneseo	Henry.
J. H. Stewart	Quincy	Adams.

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Name.	*Post Office.*	*County.*
John S. Seeley	Oswego	Kendall.
H. Schroeder	Bloomington	McLean.
Daniel Sill	Normal	McLean.
Smiley Shepherd	Hennepin	Putnam.
J. B. Spaulding	Springfield	Sangamon.
Edgar Sanders	Chicago	Cook.
Lloyd Shaw	Tremont	Tazewell.
H. Siebenthal	Wenona	Marshall.
D. B. Stiles	Lane	Ogle.
J. S. Shearman	Rockford	Winnebago.
J. A. Sewall	Bloomington	McLean.
L. A. Shepard	Chicago	Cook.
W. N. Sennett	Bloomington	McLean.
I. W. Stewart	Hennepin	Putnam
George W. Shaw	Garden Grove, Ind	
Isaac Snedecker	Jerseyville	Jersey.
E. G. Trask	Granville	Putnam.
J. H. Tice	St. Louis, Mo	
Oscar Taylor	Freeport	Stephenson.
E. Tapping	Makanda	Jackson.
J. M. Vandervort	Tiskilwa	Bureau.
W. W. Vanenam	Briston	Kendall.
L. D. Vateaw	Eureka, Mo	
Abner Williams	Galesbug	Knox.
J. H. Wilson	Sandoval	Marion.
D. B. Weir	Lacon	Marshall.
R. W. Waterman	Wilmington	Will.
C. H. Weeks	Joliet	Will.
J. L. Wilson	Winetka	Cook.
W. P. Wlils	Bloomington	McLean.
J. M. Wills	Bloomington	McLean.
G. Wilgus	Richview	Washington.
A. R. Whitney	Franklin Grove	Lee.
J. R. Whitney	Franklin Grove	Lee.
John G. Zeller	Spring Bay	Woodford.

Total number of members, 153, representing 43 counties and five other States. Of counties, McLean furnished 19 members; Madison, 11; Putnam, 10; Cook, 9; Kendall, Lee, and Sangamon, 6 each; Jackson and LaSalle, 5 each; Bureau, Ogle, Marshall and Winnebago, 4 each; Henry, Knox and Will, 3 each; Christian, Hancock, Iroquois, Macon, Marion, Macoupin, Livingston, Rock Island, Stephenson, Tazewell, Washington, Union, 2 each; Adams, Carroll, Douglas, Fulton, Edgar, Jersey, Lake, Mercer, Peoria, Perry, Randolph, St. Clair, Vermillon, Whiteside, and Woodford, 1 each. From the State of Missouri, 6 members; Wisconsin, 2; Iowa, Indiana and Ohio, 1 each.

CONSTITUTION,

AS AMENDED DECEMBER 9TH, 1864.

I. This Association shall be known as the *Illinois State Horticultural Society*.

II. Its object shall be the advancement of the Science of Pomology and of the art of Horticulture.

III. Its members shall consist of *Annual* members, paying an annual fee of two dollars; of *Life* members, paying a fee of twenty dollars at one time; and of *Honorary* members, who shall only be persons of distinguished merit in Horticulture or kindred sciences, who may by vote be invited to participate in the privileges of the Society. The wives of members shall be members without fee.

IV. Its officers shall consist of a President, one Vice President from each Congressional District in the State, a Corresponding Secretary, two Recording Secretaries, a Treasurer, and an Executive Board, which shall consist of the President, Ex-President, and one other member; all of whom shall be elected at the annual meeting, and serve from the first of January until the thirty-first of December, or until their successors are elected.

V. It shall hold annual meetings in the month of December, as the Society or the Executive Board may direct.

VI. This Constitution may be amended at any regular meeting by a two-thirds vote of the members present.

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BY-LAWS.

I. The President shall preside at all meetings of the Society; call meetings of the Executive Board, and under its direction, have a general superintendence of the affairs of the Society, and direction of the expenditures of money; he shall deliver an annual address upon some subject connected with Horticulture; and shall appoint all committees, unless otherwise ordered.

II. The Vice Presidents, in the order of their districts, shall act in case of the absence or disability of the President; and shall, by correspondence and personal intercourse with the Horticulturists of the various counties of their respective districts, endeavor to organize local societies, obtain accurate information of the condition and progress of Horticulture therein; and report annually, in writing, to the Society.

III. The Corresponding Secretary shall attend to all the correspondence of the Society.

IV. The Recording Secretary shall record the proceedings of the Society, file and preserve all papers belonging to it, and prepare its reports for publication.

V. The Treasurer shall receive and keep an accurate account of all moneys belonging to the Society, and disburse the same upon the written orders of the President, which he shall retain and file as vouchers; he shall make an annual report to the Society of receipts and disbursements, which, with the vouchers, shall be referred to the Executive Board for settlement.

VI. The Executive Board shall, subject to the direction of the Society, manage all its affairs.

VII. There shall be chosen annually by the Executive Board a Standing Committee of three, (one from each of the three divisions of the State,) who shall, independently, report annually on the following subjects:

Meteorology in its relations to Horticulture.
Geology and Mineralogy in its relations to Horticulture.
Ornithology " " "
Entomology " " "
Botany " " "
Fruit Catalogues.
Orchards and Vineyards.
Ornamental and Useful Tree Plantations.

VIII. These by-laws may be altered at any meeting by a majority vote.

HORTICULTURAL LAWS OF ILLINOIS.

AN ACT TO INCORPORATE THE ILLINOIS STATE HORTICULTURAL SOCIETY.

SECTION 1. *Be it enacted by the People of the State of Illinois, represented in the General Assembly*, That Smiley Shepherd, O. B. Galusha, S. G. Minkler, G. W. Minier, W. C. Flagg, J. T. Little, W. H. Van Epps, Lewis Ellsworth, Jason C. Ayres, W. A. Pennell, J. F. Fell, W. Durley, Samuel Edwards, their associates and successors, members of the Illinois State Horticultural Society, be and are hereby declared to be a body politic and corporate, known by the name and style of "*The Illinois State Horticultural Society*"

§ 2. The object of the Society being to promote the science of Pomology and the art of Horticulture; they shall be allowed for those purposes only to take and hold real and personal estate to the amount of fifty thousand dollars.

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AN ACT TO PUNISH FRUIT THIEVES.

Be it enacted by the People of the State of Illinois, represented in the General Assembly, That if any person or persons shall hereafter enter the inclosure of any person, without the leave or license of such owner, and pick, destroy, or carry away the fruit of any apple, plum, peach, pear, or other fruit tree or bush, such person or persons shall be guilty of a misdemeanor, and upon conviction thereof, may be fined any sum not less than ten dollars, nor more than fifty dollars, and may be imprisoned in the county jail for any period not exceeding twenty days. The penalties incurred by a violation of this act may be enforced by indictment in any court having jurisdiction of misdemeanors in the county where the offense is committed, or the fine may be recovered in an action for debt before any justice of the peace of such county.

APPROVED *February* 26, 1861.

AN ACT FOR THE PROTECTION OF FRUIT, FRUIT AND ORNAMENTAL TREES, SHRUBBERY AND VEGETABLE PRODUCTS.

SECTION 1. *Be it enacted by the People of the State of Illinois, represented in the General Assembly*, That if any person or persons, in this State, shall willfully, maliciously and without lawful authority, cut down, root up, sever, injure, peel or destroy any fruit or ornamental tree, cultivated root or plant, fruit or other vegetable production, grape, strawberry or cranberry vines, currant, gooseberry, raspberry, or cultivated blackberry bushes, standing or growing on or being attached to the land of another, or shall, willfully and without lawful authority, cut down, root up, destroy or injure any fruit or ornamental tree or shrubbery, planted or growing on any street, lane, or alley, or public grounds, in any city, borough or incorporated town in said State, every such person so offending, shall be deemed guilty of a misdemeanor, and, on conviction thereof, shall be punished by a fine of not more than five hundred dollars, or by imprisonment in the jail of the county not exceeding three months, or both, at the discretion of the court, and shall, moreover, be liable in double the amount of damages to the party injured.

This law to take effect from and after its passage.

APPROVED *February* 15, 1865.

AN ACT FOR THE PROTECTION OF GROWING FRUIT.

SECTION 1. *Be it enacted by the People of the State of Illinois, represented in the General Assembly*, That if any person or persons shall, hereafter, enter the inclosure of any person, without leave or license of such owner, and pick, destroy, or carry away any part or portion of the fruit of any apple, pear, peach, plum, or other fruit tree or bush, such person or persons shall be deemed guilty of a misdemeanor, and, upon conviction thereof, may be fined in any sum not less than ten nor more than fifty dollars, and may be imprisoned in the county jail for any period of time not exceeding twenty days. The penalties incurred by a violation of this act may be enforced by indictment in any court having jurisdiction of misdemeanors in the county where the offense is committed, or the fine may be recovered in an action of debt before any justice of the peace of such county.

APPROVED *February* 16, 1865.

CIRCULAR.

ALTON, ILLINOIS, *November* 10, 1864.

the Horticulturists of the West:

The Illinois State Horticultural Society will hold its *ninth* annual meeting at the State Normal University, in Bloomington, on Tuesday, Wednesday, Thursday and Friday, De-

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A committee of reception will be in attendance at the "Junction," each *daylight* train, to welcome the guests and assign them places of entertainment.

Specimens of Fruits, Wines, Flowers, Seeds, Scions, etc., are solicited for examination and distribution.

The Illinois Central and the Chicago and Northwestern railways will return members free, on the certificate of the Corresponding Secretary. The Chicago and Alton railway, on a like certificate, will return members on payment of one-fifth fare.

Persons unable to attend can become members for 1865, and be entitled to a copy of the forthcoming Transactions, on the remittance of one dollar to the Treasurer.

REPORTS, ETC., EXPECTED.

President's Address, Treasurer's report, Secretary's report, Vice Presidents' reports on the condition and progress of Horticulture in their respective districts.

Report of Special Committee on Pear Blight—Claggett, Schroeder, Douglass, Shepherd and Pettingill.

Report of Special Committees on Pruning the Apple and the Pear—*Northern Illinois*—Whitney, Galusha and Murtfeldt. *Central Illinois*—Dunlap, Stuart and Hull. *Southern Illinois*—Baker, Finley and Hadley.

Report of Committee on Incorporation, etc.—Andrews, Whitney and Little.

Reports of Committees on Scientific Investigation—*Orchard Sites*—Hull, Phœnix and Rosenstiel. *Fruit Soils of Illinois*—Worthen, H. Englemann, C. N. Andrews. *Birds Injurious and Useful to Horticulture*—R. Kennicott, Clifford and Holder. *Insects Injurious and Useful to the Horticulturist*—Thomas, Walsh and Hull. *Vegetable Disease, etc.*—Geo. Engelmann and Hull.

Papers are solicited on all topics connected with Horticulture.

SMILEY SHEPHERD, *President.*

W. C. FLAGG, *Corresponding Secretary.*

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ILLINOIS STATE HORTICULTURAL SOCIETY.

ANNUAL MEETING FOR 1864.

FIRST DAY—MORNING SESSION.

Pursuant to call, the State Horticultural Society met at the hall of the Philadelphian Society, in the Normal University building, in the village of Normal, Tuesday morning, December 6, 1864.

The meeting was called to order by the President, Mr. Smiley Shepherd.

President Edwards, of the Normal University, welcomed the Society to the village of Normal and to the University building, in a speech, which was substantially as follows:

WELCOME OF PRESIDENT EDWARDS.

Mr. President, and Gentlemen of the Illinois Horticultural Society:

I have been informed within a very few minutes that it would be agreeable to have me pronounce to this Society the welcome which we all feel. We welcome you most cordially to the village of Normal, and to this building. The only difficulty is that the English language does not give us the words with which adequately to express the welcome we all feel.

We do not forget the influence and bearing of your Society upon the public health even of this country. We do not forget that the arts of this Society have given us the antidotes for that malaria that once diseased and poisoned our people. We do not forget the influence of this Society in beautifying these prairies; in increasing the fruits and adding to our wealth. We do not forget how you have stimulated enterprise in the growth of fruit and other trees, which are so much of a necessity with us.

But there are other reasons, besides these of the utility of the Society, why we welcome you; and I feel that I cannot state those reasons as well as Mr. Overman would have stated them. He would undoubtedly have alluded more appropriately to the social reunions of former meetings, and the vast amount they have added to human enjoyment and the development of human sympathy. All these pleasant thoughts combine to intensify our feelings of welcome to you to-day. We welcome you in the hope that we shall be able to provide for your enjoyment and contribute something to the great cause in which you are engaged. We welcome not only those of you who are from the State of Illinois, but from neighboring States. We are glad to see that gentlemen from other States are willing to spend their time and incur the expense of meeting with us. I hope they may aid us by their counsels, and be benefited in return; and that by the multiplicity of counsels we may rise in dignity and importance, and send forth an influence that shall be felt throughout the State, and wherever the art of horticulture is cherished.

I had no expectation, until within about three minutes of the time I rose, of addressing you at this time, or I should have been better prepared for this duty.

I wish I could express the welcome which we all feel, which is felt by every man, woman and child in this neighborhood. We welcome you, hoping you will have an agreeable and profitable session; and also hoping that we may be able to contribute something to your happiness, and to the art of Horticulture in this State.

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The President—It will be proper to have our meetings opened by invoking the blessing of God. I have invited the clergy of Bloomington to open our morning sessions with prayer. We shall expect all to give respectful attention. Mr. Price, will you lead the exercises?

Rev. H. R. Price, of Bloomington, made a short and appropriate prayer.

The President, Mr. Smiley Shepherd, delivered the following address:

ADDRESS OF THE PRESIDENT.

Dear Friends, and Fellow Members of the Illinois State Horticultural Society:

In the good providence of God we are permitted, in the enjoyment of many mercies, to come together to celebrate our *ninth* annual convocation.

In addition to all the blessings and comforts that have attended us through another year, we rejoice to find a warm and cheerful welcome from the large-hearted hospitality of this goodly village, with its royal school for teaching those who are to mold the character and much control the destinies of those who come after us—of a generation now just rising to exult that equal rights and liberty in all our borders is a glorious reality, and not the gilded sentimentality of spurious hypocrisy; to exult that from the north to the south, and from the east to the west, through our whole land, peace reigns in truth and righteousness, without regard to creed or complexion.

We gratefully record the kindness extended us in permitting us the privilege of occupying this spacious and comfortable place with our meeting, and hail with high satisfaction any and every evidence that our labors in the sphere we occupy are in a measure appreciated as a public benefit, and thus take courage to press forward in our efforts to advance the public welfare, by promoting the knowledge and practice of that pursuit most congenial to our taste.

While we take courage in our labors, from the sympathy expressed and the generous appreciation manifested by the public in many different ways, we do not forget that the question is often asked, "What great good is there in the pursuit of Horticulture?" and, "In what and how does it pay that it should be commended?"

To those thus querulous and doubting we unhesitatingly say, that the pursuit and practice of Horticulture pays much and well in many ways.

From the stand point of pecuniary interest it pays well by affording the opportunity of realizing a larger profit from investments on a contracted surface than can be secured by agricultural operations, conducted with equal means over a larger area. Its practice is also to be commended, from the fact that many of its operations can be well and efficiently performed by those who from sex, age or infirmity are unfitted for the more active and vigorous duties of the farm.

Its economic value is farther sustained by its hygienic tendencies. The fruits of the earth were originally designed and given by the Creator for the benefit of his creatures, and experience has so long and so very fully demonstrated their adaptation to this beneficent purpose, that few or none can be found to meet the assertion with denial. As a hygienic prescription it is unsurpassed in imparting a generous hilarity of spirit and a vigorous glow of health to the cheek of a young lady. From my age and experience I feel fully warranted in recommending its universal application as a specific beyond and above any and all the medical compounds yet invented.

But farther, Horticulture pays æsthetically.

The progress of civilization and the advancement of society in all the arts and sciences that indicate man's moral and intellectual superiority above the irrational creation, is shown in nothing more unequivocally than by approximation toward the outward condition in which the first family were placed, and nothing more certainly affects the mind, as it were by a kind of instinct, than that the absence of these outward symbols of civilization and refinement evidence nothing better than low, vulgar brutality of feeling or fierce barbarity of passion.

The cultivation of a sympathy for the refining and elevating art of Horticulture aids

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We admit the exception, and say that a more complete knowledge of it as a science, and a more thorough exhibition of its benefits in practice, would only make the exceptions more apparent. Pretenders all confess to the dignity of its claim, but fail to exhibit their effects in their conduct. The objector, without controverting the claim we make, condemns the pretender for a default to duty, while he practically joins in the default by the neglect of showing a more consistent result from assumed superior motives.

Fortified then in the conviction that our pursuits are in strict consistency with that law which requires us to love our neighbors as ourselves, we hesitate not to commend the cause to a more universal acceptance than that it has ever yet attained.

In this connection, it is obvious to remark that some more general organization, some more systematic arrangements must be effected before we can make our influence in favor of the cause of Horticulture adequately felt by the community.

Pointing, too, in this same direction, as indicative of duty, is the great crisis in our national affairs, that will evidently change greatly our social as well as our political condition, thereby admonishing us wisely, in time, to occupy that post of influence that will make our efforts strongly tell for the good of coming generations.

After much thought on this subject, I venture to suggest to this Society the attempt to complete an organization of this State somewhat after the present model of our county agricultural societies. The smaller societies to hold during the year as many festivals and fairs as they think proper. The fees for membership in these societies to be set apart to procure copies of this (the State) Society's proceedings, one at least for each member, and as many more copies as they might wish to give as premiums for the production or presentation of anything new or valuable. The proceeds of the festivals and fairs to be a fund to provide the necessaries for such occasions, and to defray the expense of lectures, etc.

The advantages of such a system would be that copies of our annual proceedings would reach every neighborhood in the State, and would be a ready reference for information or instruction on any topic directly pertinent to Horticultural pursuits. Popular information in this way would reach thousands now utterly ignorant of its benefits, and could scarcely fail of producing an extensive and beneficial effect.

The pleasure of a social meeting to enjoy the relish of a good dish of our finer fruits, such as strawberries, cherries, raspberries, blackberries, grapes, pears, peaches, etc., etc., would make all the young people, besides a good many that are not very young, quite willing to pay for the treat several times in the course of the season, while the satisfaction of seeing the good things that a bountiful Creator has given for the benefit and enjoyment of His creatures, thus spreading and multiplying the comforts of all, would make up a comfortable degree of enthusiasm in every heart above savage misanthropy.

The benefits of the social contact of mind and mind in the enjoyment of common benefits, would be, morally, worth thrice the cost of the experiment.

Another great advantage would be assuring to the State Society the certainty of funds, not only to publish its Annual Transactions, but to pay respectable premiums to such competent scientific and practical operators in the line of our pursuits as would be able and willing to furnish us essays and papers on many branches of our calling, that would render our annual contribution for the benefit of the public worth ten-fold more than it is at present.

To effect such organization and get it into complete operation as a system, will require tact and skill, with strong energy and persevering effort. The object is worthy and the effort far from being hopeless.

The success of our cause depends much upon the estimation in which our moral character is held by the community. If from carelessness we inadvertently give sanction to anything unworthy of attention, we by so doing much lower our claim to public confidence; and if by any means the appearance of sinister intention can be attached, the forfeit will hardly be recovered by years of patient integrity. Nor is it alone from the formal acts of our body that the standard of our moral character will be taken; but if those known to be held and received as worthy of membership amongst us are found guilty of gross frauds upon those reposing confidence in our uprightness, and we offer no protest against it, we will certainly be held party participants in the offense, and have to pay the full moral penalty of the crime.

Impelled by a conviction of the truth and importance of these principles, I feel bound to present to this Society the fact that a member of this body, long and favorably known in the Horticultural world has been charged over a highly respectable name, in the public prints, with perpetrating extensive frauds upon public confidence reposed in the recommendation of this Society, by selling worthless and spurious articles, knowing them to be such, for the true and genuine approved and commended by vote of this body.

Now that this Society may stand vindicated before the world of any complicity with fraud, or of any connivance at the same among its members, I recommend the appointment of a committee to examine into this case, and any other, if such like there may be, and report the facts and evidence sustaining them to us, that they may go upon record, and thus our character for integrity be preserved, the innocent party stand justified and clear, and the guilty left to bear his shame.

A farther matter that I deem of sufficient importance to press upon the attention of this

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body is that correspondence with public spirited individuals abroad, and with kindred associations in the eastern portions of our country, strongly indicate the duty of taking early measures to collect and preserve an accurate and full historical record of all organized efforts heretofore made in behalf of Horticulture in the State of Illinois. These, with contributions of the like kind from sister States, would form the first leaves of a library that to the historian of coming years will be precious as dust of gold when seeking, with philosophic eye, the causes, remote and proximate, that entered into the germ of society that has unfolded to the magnitude that shall then exist.

I have further to note and recommend to your attention that correspondence with the Commissioner of the Agricultural Department of our government shows an entire want of any system by which a full statistical report of the annual value of our horticultural products can be had. This matter I especially recommend to the attention of the committee having in charge the securing of a charter of incorporation, that it be held legally incumbent on this Society and all subordinates and auxiliaries.

For the satisfaction of all persons interested it may be proper to state the reasons impelling the Executive Committee to decline holding a public State Fair for the exhibition of fruit. The facts are briefly these: The spring opened favorably, and the show of flowers was profuse beyond anything ever known. As the season advanced, this profusion left only a very small per cent. of fruit set. This small per cent. was afterwards thinned out to what would, if well grown, have yielded only a moderate crop. To this remnant, all the insect enemies of the apple paid early and persistent attention, so that in many portions of the State a sound, fair specimen can scarce be found.

The drouth had an injurious effect over a large portion of the State. The peach, apricot and nectarine failed to put on flowers, and in many places were killed outright. A large portion of the cherry family did but little better; only a few varieties yielded moderate crops. The grape, where left unprotected, lost most of its fruit buds, and in many places the vines were killed to the snow line. The pear, as a kind of exception, did, where it had escaped the blight of former years, put on a medium show of flowers, and set a fair crop of fruit. The drouth of summer was oppressive; the blight, though not so disastrous as in former years, was widely prevalent, whilst a member of the Curculio family, not much known heretofore, made his mark in the most impressive form wherever he found a pear.

Discounting all these causes, there were still specimens of a respectable number of varieties found scattered all over the State.

The smaller fruits were, from the effects of frost and drouth, a most mournful failure. The strawberry was estimated at about one-fourth of a crop. The raspberry and blackberry were not over a half crop. In different sections of the State the fruit on large tracts of country was more than half of it dried to a crisp before reaching maturity. The currant and gooseberry did somewhat better, but fell below an average.

With these unpromising prospects for a show of fruit, and our finances so low that we were in debt for the printing of our last year's proceedings, instead of having funds to expend in premiums, we thought it best to postpone the matter for another year, hoping that at this meeting some such system might be devised and adopted as to prevent such deficiency in funds as has crippled our operations for the past season. That something might be done to relieve our financial pressure, a call was made through the public prints for our horticultural friends to meet at Decatur, at the State Agricultural Fair, that at a meeting then and there to be held, that something might be done to clear away our difficulties. Of this effort suffice it to say, that my best efforts failed in securing a quorum willing to act or formally to advise on any such subject.

These matters will be in your hands, and come more distinctly before you in the reports of those having them specially in charge.

With these imperfect reflections and hasty suggestions, I commit myself to your generosity, craving your indulgence for my many imperfections, and assuring you of my best efforts and most earnest wishes for the honor and success of the cause of Horticulture through the instrumentality of this Society.

On recommendation of the Executive Board, the Society, by a vote, fixed the price of membership for the present year at two dollars.

A recess of a few minutes was then taken to give those present an opportunity to pay over to the Treasurer the price fixed upon.

After the Society was called to order, on motion, a committee of three was appointed to report on the names of gentlemen proposed as honorary members. The committee consisted of E. S. Hull, of Alton, F. K. Phœnix, of Bloomington, and G. W. Minier, of Tazewell county.

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The committee reported in favor of the following gentlemen, and they were admitted as honorary members: Messrs. Chas. Duigee, of Chester county, Pa.; Suel Foster, of Muscatine, Iowa; J. C. Ratcliffe, of Richmond, Ind.; and Levi Jones, of Centreville, Ind.

Messrs. Jones and Ratcliffe appeared as delegates from the Horticultural Society of Richmond, Ind.

Messrs. W. K. Robinson, T. S. Faulkner, and S. B. Wiss appeared as delegates from the Farmers' and Mechanics' Institute, of Marshall county, Iowa.

Seth E. Jones, Esq., came as delegate from the Jackson Fruit Growers' Association.

TREASURER'S REPORT.

W. C. Flagg read the Treasurer's Report. The following is the important part of said report:

Publishing Transactions	$500 00
Other expenses	82 57
Total	$582 57
Receipts from subscriptions, etc	379 70
Deficit	$202 87

Mr. Flagg moved that the report be referred to the Executive Committee. Carried.

Mr. Galusha—I move that a committee of three be appointed by the chair to prepare a programme, and that the committee be requested to report in one hour. Carried.

Messrs. Galusha, Minier and Andrews were appointed a Committee on Programme.

REPORT OF THE CORRESPONDING SECRETARY.

I have to report the following detail of my official business in 1864:

PUBLISHING TRANSACTIONS OF 1863.—Messrs. Bragdon, Galusha and Starr had been appointed a publishing committee, but Mr. Bragdon having removed from the State, and Mr. Galusha being too far away to consult personally, the labor of preparing the minutes fell upon Mr. Starr, and the proof reading upon myself. The amount of matter was found to be nearly double what was anticipated, but by using a smaller type for the reports and essays, and otherwise condensing, the whole was put into a volume of 147 pages—700 copies in paper, at 31¼ cents per copy, and 500 copies in muslin, at 56¼ cents per copy, making a total cost of $500 for the 1,200 volumes. The unexpected increase of matter and the scarcity of printers and binders, delayed the publication nearly three months, and was a source of great discontent to subscribers, and more annoyance to the recipient of these complaints. Liberal subscriptions were made by the faithful few who have always sustained our Society in its times of need, but cash orders from outsiders were hardly large enough to justify advertising, and we are left considerably in debt, as shown by the Treasurer's report.

A large number of copies were distributed gratuitously, being sent by mail into every county in the State, and to those interested in Horticulture beyond its limits, and it is believed have done a remunerative work in extending and ramifying the influence of our organization. I would suggest that in publishing our Transactions for the coming year, we limit the edition to 500 copies in paper, and distributed only to members for 1865.

Here also I would suggest the desirability of having a fund created by establishing life membership, and soliciting donations and bequests, whose interests should be a perpetual publishing fund in the control of the Executive Committee.

CIRCULARS ISSUED.—Two circulars, under the sanction of the Executive Committee, were issued about the first of July—one to collect facts concerning the effects of the intense cold of January, and one asking for historical information as to the inception and progress and condition of Horticulture in the various counties of our State. To the first circular, answers were received as follows: In Northern Illinois, from the counties of

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Bureau, DeKalb, Lee, Kendall, Marshall (2), Peoria, Rock Island, Winnebago (2)—total, 10. In Central Illinois, from the counties of Champaign (2), Calhoun, Douglas, Fulton, Jersey, McLean (2), Sangamon, Scott—total, 10. In Southern Illinois, from the counties of Johnson, Madison, Perry, Randolph, Union, Wabash, and Washington—total, 7. In all, 27.

To the second circular, answers were received: In Northern Illinois, from the counties of DeKalb, Lee, Kendall, Marshall, Peoria, Rock Island, and Whiteside—total, 7. In Central Illinois, from the counties of Calhoun, Champaign, Douglas, Edgar, Fulton, Hancock, Jersey, McLean—total, 8. In Southern Illinois, from the counties of Clark, Johnson, Madison, Perry, Randolph, St. Clair, Union, Wabash—total, 8. In all, 23. Other States—from Missouri and Kentucky.

Exchanges.—It was also authorized by the Executive Committee to institute a system of exchanges with kindred Societies, with the following results: Seventeen different Societies have been written to and copies of our bound Transactions of 1861-2-3 sent them. Something more than half of those addressed have responded favorably, and a number have already sent their Transactions.

B. P. Johnson, Secretary of the N. Y. State Agricultural Society, sends the Transactions of 1855, 1856, 1857, 1858, 1860, 1861 and 1862, and some 80 copies of 20 different pamphlets.

Nathaniel Holmes, Secretary of the St. Louis Academy of Sciences, furnishes us with a complete set (5 numbers) of Transactions.

T. P. James, Treasurer of the American Pomological Society, sends its Transactions for 1852, '58, '60 and 62.

Wm. Muir, Secretary of the Missouri State Horticultural Society, supplies a complete set (4 numbers) of its proceedings.

Geo. M. Beeler, Secretary of the Indiana State Horticultural Society, sends a complete set of the Transactions of that Society.

M. B. Bateham, Secretary Ohio Pomological Society, sends Transactions for 1857, '58, '59, '63 and '64.

It is expected that to this collection will soon be added the Transactions, more or less complete, of the Massachusetts Horticultural Society, and Connecticut Agricultural Society. Several other Societies remain to be addressed.

Fruit Catalogue.—The American Pomological Society, at its late meeting at Rochester, having requested that the various State Societies report Fruit Lists, I have prepared one, made up from our last Transactions, for the revision of the Society or its Committees.

Reports from Vice Presidents were handed in by the Corresponding Secretary.

The sessions of the Convention were fixed at two, daily, corresponding to the session of the Normal School.

Adjourned till afternoon.

FIRST DAY—AFTERNOON SESSION.

An order of business was reported by the Chairman, Mr. Galusha, which was adopted.

By invitation of Dr. Sewall, the Society adjourned for fifteen minutes, to examine the rooms of the Historical Society of the Normal Institute.

A committee of three were appointed on President's Address, consisting of Bryant, Overman and Huggins, who reported as follows:

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Finally, the committee earnestly recommend to the notice of the Society the suggestions of the President in regard to the collection of horticultural statistics.

All of which is respectfully submitted.

A. BRYANT, Sr., *Chairman.*

INTRODUCTION AND CULTIVATION OF FOREST TREES.

Mr. Galusha, as one of the committee appointed last winter to prepare a pamphlet on this subject, presented the same as the report of the committee,* and desired to have the list, as well as a former list of the Society, read and passed upon by the Society.

Mr. Phœnix—Is the Cotton Wood in that list?

Mr. Galusha—No.

Mr. Phœnix moved it be added.

Mr. Minier—There are two objects to be attained in having proper trees on the prairies. The first is for summer protection, and the next is for winter protection. Some think they are not necessary, except for winter protection, but I think they are absolutely necessary for summer protection. It strikes me, sir, that we can modify our storms, our climate, our atmosphere. I need not tell you that trees will add greatly to the beauty or convenience of a place. They add very largely to its money value. I think I have demonstrated in my neighborhood that no man can accept, to advantage, of a piece of timber for fuel, at a distance of five miles from his place, as a present. We can raise our wood at our prairie homes cheaper than we can get it from that distance if the land was presented to us.

I do not think much of the Cottonwood, but if it is the only thing we can get a farmer to have, let us get him to have that; but when we have trees that are so much better, I would suppose that it would be bad policy to recommend the Cottonwood tree.

I say let us set down something better than the Cottonwood in our list. The Silver-leaf Maple, I think, is better. There is but little difficulty in procuring the seed. Strange as it may seem, there are more than one-half of the men who do not know when the seed of that tree ripens. I said on one occasion that it was the first tree to blossom in the spring, but it was said that the Elm blossomed first. I am satisfied, however, that it is the first to mature its seed. It usually ripens in this section about the 20th of May. When the Crab tree is blooming in all its glory is the time to gather the seed. You will never fail to find them at that time. The seed must be gathered promptly, as the worms, birds and squirrels immediately attack and destroy them. The safe way is to gather the seed from the trees before it falls. There is no necessity of depending upon the nurserymen for trees, because you can raise more easily. This tree is easily raised, and produces more fuel than the Cottonwood. It will do for fuel in a very few years. The Cottonwood will produce more bulk, but not so much warmth. We must never forget the Black and White Walnut. The Silver-

*The report was printed in full in volume of Transactions, for 1868.

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leaf Maple will bear transplanting, but the Black Walnuts throw down a tap root, and for that reason are not adapted to transplanting. Select some place on the premises where you want them to grow, and plant the seed in the fall—or in the spring, if you save the seed. It has been truly said that the Black Walnut is the Mahogany of Illinois.

These deciduous trees are easily obtained. If this Society could but persuade the people to plant these three kinds of trees in sufficient quantity, they would have done a vast amount of good to the people of Illinois.

I have no objection to the Evergreen trees, but they are not so applicable, they are not so obtainable. I would also add a word in favor of the Blue Ash. I think that we should offer a premium, and that our local horticultural and agricultural societies should offer premiums for the best cultivated forest trees indigenous to our soil. I would prefer offering a premium upon the Silver-leaf Maple, and that grade of trees. They are vastly more valuable than the Evergreens. They are valuable for fuel. I would like to ask if any gentleman has tried planting the seed of the Hard Maple, and growing it in that way. I am satisfied that if we plant the seed we will have larger trees at the end of ten years than if we transplanted trees an inch in diameter. I contend that we can raise our trees better from the seed than in any other way. This idea may conflict with the interest of the nurserymen, but we have not met to grind their axes, but to give the country the best information we can.

I hope our action will be such as will induce our farmers to plant forest trees, and that by and by we shall see clumps and belts of trees all over our prairies. When we get wise enough to plant trees, we shall see Illinois begin to develop as it ought to do. The State is so nearly level that we have but little to do in making our railroads, except to lay down the ties and iron. But I tell the Suckers they have got something to do for themselves, and one of those things is to plant trees.

Mr. Galusha—Since the report of the committee on the Ash-leaved Maple, (*Acer negundo*) we have had additional testimony in respect to the sugar producing properties of the tree, and it is recommended for general cultivation. In order to encourage people to plant trees we must hold out as many inducements as possible. A friend has sent here a sample of sugar. It was made under unfavorable circumstances, the sap standing four or five days before being boiled. From about ten gallons of it was produced two pounds of sugar and about half a pint of excellent sirup. The sugar, in appearance and taste, cannot be distinguished from the Hard Maple. The tree is a rapid grower, will do to tap at ten or twelve years old, is very hardy.

Mr. Shepherd—The same sugar was shown at the Buel Institute, and was awarded a large premium. The gentleman who made it

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had little faith at the commencement of boiling it, but after producing the sugar, was convinced that the sap was richer in saccharine matter than the Hard Maple. The general maximum size the tree attains is about twelve inches in diameter. The tree has not generally been considered of much value, but if it makes a good shade, and sweetening in the spring, it is worth cultivating. I do not consider it of value for firewood.

Mr. Huggins—Thinks Mr. Minier mistaken about the Silver-leaf Maple being the first to blossom. The Scarlet-leafed Maple is about a week earlier. Finds no difficulty in regard to insects destroying seed; wait until they fall to gather them, and even ship long distances with success.

Mr. Phœnix—Thinks the Cottonwood as good as Lombardy Poplar.

Mr. Overman—It is a good bird taming tree, and would do well to run worthless grape-vines upon. Although a rapid grower, thinks other trees much more valuable, as we were not planting trees merely for the present generation. Thought the Osage Orange would prove a valuable timber, although a slow grower.

Mr. Bryant—Would be unwilling to recommend the Cottonwood or Lombardy Poplar for cultivation, if we could induce people to plant any thing better. Our object is to encourage to plant trees. Would be in favor of putting them in a secondary class. We want something to break the winds and modify our climate. A general planting of screens or belts of timber would have a great effect on our climate. Evergreens for that purpose are best. Do not take any pains to cultivate Cottonwood, but let them grow along the fences where they come up.

Mr. Baldwin—The Cottonwood grows larger than the Soft Maples, and for screens I think it preferable to other trees. Care should be taken in selecting cuttings from trees which do not contain the pistilate blossoms, to avoid the floating cotton, which is so disagreeable. Had never seen a Cottonwood struck by lightning. Would favor a secondary list for the Cottonwood and Lombardy Poplar.

Mr. Overman suggested as a reason why lightning did not strike the Cottonwood was that it could not split it if it did.

Mr. Foster, of Muscatine, Iowa—Would prefer the Cottonwood to some others upon the list.

Mr. Galusha read from the proceedings of the Society a list of trees recommended for general cultivation, comprising nearly all the forest trees, but now wished the Society to select a smaller number of good trees to recommend and fix the people's minds upon.

Mr. Minier—If the members of this Society now present will induce the local agricultural societies to offer appropriate premiums for the best acre of cultivated trees indigenous to their own county, they will raise the wind. We want the county societies to offer premiums.

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Mr. Bryant—That is what we want.

Mr. Foster—Who knows the relative value of trees? If a Committee could get at this value for all purposes, amount of growth per year, etc., it would be of incalculable value, but without it, we shall unceasingly differ as to their merits.

Mr. Overman—In estimating the value of wood for fuel, the weight and not bulk would determine its value.

Mr. Bryant—Would like to call attention to the Osage Orange as a timber tree. Have been assured by persons who have lived in Texas that the trees sometimes grow to sixty feet high, and are absolutely indestructible, or nearly so, and that it never rots. If this is so, thought it would be well to plant at such distances as not to dwarf it, for the purpose of providing posts and stakes.

At this point of the discussion the subject of a revision of the list was referred to a committee of three—Messrs. Overman, Phœnix and Minier.

Mr. Galusha—As I understand, this committee is only on Deciduous trees; I move a committee be appointed to recommend a list of Evergeen trees, with their various uses and specific qualities.

The following Committee was appointed: Messrs. Galusha, Williams and Bryant.

Mr. Galusha moved the appointment of a committee to test further the sugar qualities of the *Acer Negundo*, and to report at the next meeting.

The following committee was appointed· Messrs. Elmer Baldwin, T. McWhorter, and Dr. Hull.

At this point of proceedings, the regular order of business was suspended, to listen to remarks from President Edwards, of the Normal Institution, who explained the operations of the school, and invited the Society to visit the school in session, which they afterwards did, much to their satisfaction.

Mr. Gennert, of Chatsworth, by invitation of the Society, spoke at considerable length upon the manufacture of sugar from the beet. He said that it had long been successfully done in Europe, and expressed the belief that it could be successfully done in Illinois, and said he looked forward to the day when Illinois would have hundreds of thousands of dollars invested in establishments for the manufacture of beet sugar. And he expressed the belief that they would all be paying institutions.

Adjourned until 7 o'clock, P. M.

EVENING SESSION.

The reports of Vice Presidents being called for, Dr. Hull, of Alton, presented one from the Alton Horticultural Society, from which we gather the following history, etc., of the Society:

The Alton Horticultural Society was organized November 12, 1853. From the time of its formation to January 1, 1864, the ave-

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rage attendance at monthly meetings would not vary much from eight. Since the reorganization, the average attendance has been not far from fifty, one-third to one-half of whom were ladies.

To show the variety of fruits grown about Alton, the report gives the number of varieties of fruits exhibited in 1855. Peaches, 33; plums, 38; apples, 130; pears, 48; pears from the east, 163.

A further report from this Society was made by Dr. Reed, the chairman of a committee of three, setting forth the advantages afforded at Alton for the location of the Agricultural College, accompanied by a motion to secure the co-operation of the Society for that location.

Dr. Hull here read his paper on

ORCHARD SITES.

Before considering sites best suited to the wants of the Horticulturist, it will be necessary first to understand the ability of plants to adapt themselves to differences of climate.

The question of acclimating plants, briefly stated, means nothing more nor less than this, that the climate, site and soil, or the three combined, should be such that will give plants of the greatest hardihood, and will produce the most perfectly developed and mature growth, just at the time when the cold of autumn arrests and holds in check further circulation. This period of development will be reached by plants, of a given species, sooner or later, in different seasons, and in a given latitude will be found to vary, from year to year, as the seasons are hot or cold. For example, let us take two trees of the peach, one grown in Northern, the other in Southern Illinois, in which every condition necessary to rapid growth has been properly attended to. Now, at the end of the season, let us examine into the condition of the trees. The northern grown plant will, on the approach of winter, be found in the full vigor of growth, with all that degree of succulency, common to immature development. If we leave it where it grew, to resist the severity of the cold, it is killed to the ground by the first hard freeze, or, if we remove it south, it is still too immature to resist our mildest winters, or, if by chance, it survives, one or more year's growth will be necessary to make it as strong as it was before its removal.

Let us now turn to our southern product. Although every appliance necessary to rapid and prolonged growth has been bestowed, yet, owing to the greater heat and length of the season in this more southern latitude, our plant has gradually formed the terminal bud of the vertical or main stem, which is developed early in September, after which, through the medium of its leaves, the branches and buds swell to those proportions reached only by mature trees. Should we, in autumn, move or transplant our southern grown tree to the most northern limit at which the peach can be made to grow, we shall find it to possess sufficient hardihood, during the

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first winter, to withstand twenty or more degrees below zero, without injury.

If we continue our experiments, and plant the cherry instead of the peach, we shall find that in the southern part of the State our trees would pass through all the stages of growth of the season, as early as the first half of July, leaving three months of rest before the autumnal frosts could act as a bar to further development. In the cherry, subjected as it has been to a longer period of time than was needed to ripen its wood and buds, and the leaves having performed their office, gradually reach that degree of maturity that renders them no longer useful, they are, therefore, cast off, and the trees are in their leafless condition when the warm autumnal rains excite them to second growth; the crude juices ascend to the leaves, making room for and creating new matter; while at the same time, in their descent, woody substances and young roots are formed by the addition to the cellular tissues. Water thus accumulates in the system, and is not decomposed or disposed of by perspiration or by granulation of the sap in the requisite degree. The tree, therefore, can neither ripen its wood nor form its inner structure, and is, therefore, incapable of resisting those extremes of temperature which would be harmless to mature plants. Both the cherry and peach, first considered, are somewhat in the same condition, and both, from similar causes, though acting somewhat differently, are about equally tender, and are incapable of resisting great extremes of cold. It, therefore, becomes apparent that a correct knowledge of the requirements of plants, in different soils and under different climatic influences, must be well known before we can select situations suitable for them.

"Most vegetable physiologists, in describing the conditions of hardihood in plants, agree that the same plants, growing in a dry climate, or in dry soil, or in a situation thoroughly drained from water during the winter, will resist much more cold than if cultivated in a damp climate, or in wet soil, or in a place affected by water in winter. Whatever tends to render tissue moist will increase its power of conducting heat, and, consequently, augment the susceptibility of plants to the influence of frost; and whatever tends to diminish their humidity will also diminish their susceptibility: this is an invariable law, and must consequently be re-

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observe the great degree of cold always present in these situations. The comparative difference in temperature will be found to be greatest when the atmosphere is still and highly charged with moisture. Small, shallow bodies of water absorb heat rapidly during the day, consequently the valley is warmer than the hill; they part with it with equal facility in the night, and now their relative conditions are changed; the warm air has risen, and the cold air, from its greater density, has descended and there remains.

The valley is not so cold in the early part of the night as it is later; much of the heat of the air is absorbed by the water in evaporation, which is always a cooling process, and the hotter has been the day, the greater will be the difference between the temperature of the hill and valley. As, for example, in certain portions of Hindostan, where the atmosphere is very dry and hot, ice of a fourth of an inch in thickness is formed on water exposed at night in broad shallow pans; this is due to the rapid evaporation which cools the water. Countries covered with dense forests, owing to their retention of moisture, are colder in the same latitude than those less thickly wooded.

Take Germany, for instance, where the vine and fruits are perfected, was once a cold and desolate region. This great change has been occasioned by the cutting down of their immense forests, thus admitting the warm air from the Mediterranean, and the consequent drying up of swamps and marshes. Yearly observations made in our neighborhood, on elevations varying from 20 to 250 feet above, and bordering on the Mississippi river, give a difference in temperature, on still nights, as great as twelve degrees.

During the past fall, at an elevation of 250 feet, and distant 200 yards from the river, frost was barely perceptible; on descending to near the mouth of a ravine, which acts as a drain for the passage of cold air to a considerable extent of country, ice had formed of the thickness of one-third of an inch. Again, commencing at an elevation not above 50 feet, where the drainage to the river was unobstructed, and from that point to the summit before referred to, frost was not observed, and tender animals and plants remained unhurt until the third of November, when they and the surrounding country were enveloped in snow; while, at the same time, a basin near the summit level, containing about two and a half acres, and depressed eighteen feet, together with the surrounding country, from which no direct outlet to the river existed, was, between the 20th of September and the 3d of November, frequently visited with frost of sufficient severity to destroy plants. In the basin referred to above, the cold was of the greatest severity at the bottom, near the southeast side, to which point the gentle pressure of the descending atmosphere from the northwest had driven, while that part of the hollow at which it entered was exempt from its effects. During the following day, when the destruction became visible, its effects were marked by a line, commencing at the bottom of the

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depression, at the west and north sides, and reaching the summit, on the southeast side, at an angle of about three degrees. Our cold winds being from the north and west, these observations will serve to show that the motion of the atmosphere may obstruct the free descent of cold air, which, from its greater density, rolls down from the high lands into the lowest depressions, and thus render north and west exposures of less value for the production of tender plants than south and east.

From what has been said, it will also appear that those situations which are elevated in immediate vicinity of large bodies of water, are most free from late and early frosts; and other sites elevated above the surrounding levels, into which cold air will fully descend, are scattered throughout the length and breadth of the States, and will be found well suited to most products of the orchard.

After reading, the subject was taken up for discussion.

Dr. Long, of Alton—I consider that elevation is a very important consideration in the selection of places for raising fruit, particularly in raising the peach. My friend, Dr. Hull, has the highest position in our section of country. The bluff is very abrupt, and he is perhaps two hundred feet above the level of the Mississippi river. One of the first farms in that region was opened upon part of the land which he now owns. Upon that there was a peach orchard; it has since been replenished with other fruits. That orchard seldom failed, while, all around, the peach crop would be cut off. In my orchard, which is a mile and a half or two miles back, my surface varies, some on high land and some in the valleys. I set out my orchard in 1839. I had set out one in 1832, a little way from it. One spring there came a very heavy frost—the trees were protected from the north and northwest. That frost killed all the fruits below a certain level; while in this latter orchard it took all the old trees, perhaps ten feet from the ground, and you could see the level of the frost very plainly; it was as level as if it had been run through by a surveyor's instrument.

The situation should be so selected as to obtain an elevation, if possible. I agree with the essayist in respect to his views of climate.

Mr. Galusha—What are those to do who live where there are no elevations—who live where the country is level?

Dr. Long—I should protect by belts of trees. For this purpose the walnut is very valuable. I would make my break-winds of

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so as to be protected, or should have artificial protection. Some have disputed the utility of sheltering orchards. I have been raising fruit for nearly thirty years where I live. I live on the east side of the forest that borders the Bureau river, in Bureau county. The elevation of the soil is not quite as great as it is in some places in that vicinity. The orchards planted along the east side of the timber have borne more uniformly and a larger quantity of fruit than those on the prairies. I think they have borne one-third more fruit. Sometimes there is but little difference. It seems to me that facts demonstrate that shelter is useful for an orchard.

Mr. Tice—I don't know but that I concur with the essayist in regard to effects of radiation of heat, but I certainly cannot agree with my friend, Dr. Long, with regard to the effects of the frost. The essayist stated that the valleys and sheltered localities were subjected to the radiation of heat, which was liable to cause a premature circulation of the sap. That is perhaps the entire philosophy that lies at the bottom of the injury of the fruit of the peach tree. If gentlemen will now examine their trees, they will find that the buds have already swollen in consequence of the unusually warm weather we have had for the last two weeks. If we have a frost that sends the thermometer five or six degrees below zero, our peach buds are all killed. The peach tree is particularly sensitive to a change of temperature. It requires a winter nap. If we have a frost that freezes the tree, that gives it its winter nap. As soon as the weather moderates, its buds begin to swell, and the fruit buds will be killed unless our winter should prove unusually moderate.

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The radiated heat develops the buds in a certain horizontal line, and the buds that have arrived at a certain stage of maturity perish on a line as level as the surface of a lake. The reason the peach tree does better on the point of a hill is because it is not subjected to this radiation of heat. The same philosophy holds good where the orchard is planted on the east side of a body of water. The water absorbs the heat in moderate weather. The reason why fruit is not so apt to winter kill on the hill-top as in the valley, is because it is not so much affected by radiated heat. Everybody knows that the frosts usually appear two weeks earlier in the valleys than on the hill-tops. This is the case when the atmosphere is still, but when there is wind to agitate the atmosphere, there is not so great a difference. We know that the radiation of heat affects the foliage of the valleys. The trees in the valley are in full leaf long before those on the hill-top. The foliation commences in the bottom of the valley and goes up until it reaches the top. Were it not for the radiated heat, the mountain tops would be the first to show foliation.

Dr. Long—With regard to the radiation of heat affecting the peach tree, I will not consume any time. So far as the fact is con-

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cerned, I have told what has happened in my neighborhood, and from these facts you can draw your own conclusions. Our orchards are on the east side of the Mississippi, and we are influenced, no doubt, by that stream, which seldom freezes over at that point. It froze over last winter, and we lost much of our fruit, killed by the freeze of the first of January.

Mr. Minier—I would like to inquire of the gentleman from St. Louis, if he, or any one else to his knowledge, ever tried to preserve the peach buds in the condition in which he now finds them? Zero will be very apt to destroy those buds. Is there any possibility of saving the fruit of those trees? I will say, that I once accidently put corn stalks around a tree on which the buds were in this condition, and they were not removed until in April, and the tree bore peaches. It strikes me that by properly covering up the buds, we might keep them.

Mr. Overman stated that Judge Bryant, of Fulton county, had saved his trees and fruit by drawing the tops together with a cord, and protecting with corn stalks.

Mr. Wilson, of Sandoval—I reside near Sandoval, and have, in connection with a neighbor of mine, between eighty and ninety acres of peach trees. Last spring the trees appeared to be injured very much, but they gradually recovered, and by heading, I think, another season will entirely erase the effect of the injury. In my orchard there were a few peaches. They were not protected. The orchard is on a slight inclination north, and is not protected by anything. The northwest wind has a fair sweep for seven or eight miles. These facts may give some information in regard to the effects of protecting orchards.

Mr. Foster, of Iowa—I live upon elevated ground near the Mississippi—I should think one hundred and sixty or one hundred and seventy feet above the river. The cold weather of 1855-6 did not kill my peach trees, while it did kill a great many of those in the valley. A neighbor of mine has been in the habit, for a few years, of bending down some lateral branches, and laying brush upon them, and has succeeded in raising peaches from these branches when no other peaches were grown in that vicinity. We learn from that, perhaps, that there is a radiation or warmth in the soil. * * When the grape vines are thrown down upon the ground, without any sort of protection, they are less liable to injury than when tied up and exposed to the bleak winds. Often in winter, when there is no snow, those vines and limbs which lay upon the surface of the ground do not kill, while those high up do. Yet those of mine high up on the bleak wind of the hill have not killed. We know that the thermometer falls lower in the valleys than in the high places.

I was in hope this discussion would turn a little more upon the apple.

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Mr. Shepherd—I have said that man was never blessed with any other one fruit so good as the apple. Our people are planting the apple, the grape and the plum.

Mr. McWhorter—Which do you consider the best exposure for an orchard?

Mr. Foster—I hardly know. The trees on the north side of a hill I think are most healthy. But the fact is well established that they bear best on the top of the hill.

Mr. Long moved that the report of Dr. Hull on orchard sites be received and filed for publication. Carried.

STRAWBERRIES.

The President announced that Strawberries was the next regular subject.

Mr. Galusha—I would like to state the design of the committee in presenting that subject. We have an extensive fruit list already recommended, and it has been frequently revised. The object is not to recall that list, but we wish to find out, if possible, a few varieties of fruits that every one can cultivate, and that will pay the most for a given amount of labor. As it is often expressed, we want "a list of fruit for the million." There are a few varieties of strawberries, and perhaps a few of grapes, that the masses can cultivate to advantage. There are a large number of varieties of strawberries, each one having some peculiarities which others do not possess—while there are but few that combine so many advantages as to pay every one for their cultivation. We want fruit that those that are not scientific can cultivate.

I will mention only one variety, and that is the Wilson's Albany. We know that it is a prolific bearer, and that its cultivation pays. It may not possess as good a flavor as some other varieties, but when it is fully ripe it is a delicious fruit. The Wilson's Albany we know has a perfect blossom, every flower producing a perfect berry. I move that the Wilson's Albany be placed on the list for general cultivation.

Mr. McWhorter—If the Wilson's Albany is ripened well it is a good fruit. The berry is richer than the most of the hardy varieties. It is really a rich and excellent berry, and it is much more easily cultivated, and will produce more than any other variety that I have ever known.

Mr. Bryant—More berries can be raised from the Wilson's Albany than from any other strawberry. I don't claim that it is equal in flavor to the very best, but I claim that it has more good qualities to recommend it for general cultivation than any other. As has been said, it is frequently picked too soon. The Wilson's Albany, when thoroughly ripe, is nearly black.

Mr. Marsh—I rise for information. I want to know if any individual has ever raised a good second crop from the Wilson's Albany?

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Mr. Edwards—I have raised a good second and third crop.

Mr. Galusha—There is no difficulty unless they are too close.

Mr. Marsh—I have never been able to get a good second crop; it runs to vines.

Mr. Kelsey—Out of nearly a hundred varieties, the Wilson's Albany is the poorest grower I have, so far as vines are concerned. It matures less vine than any other berry I know of. I consider it is more easily managed than any other. As to the quality of the berry, I consider it good if I can go into the patch and pick it myself. But I seldom find good ones in the market, because boys and girls, who know nothing about it, are set to picking them, and they suppose when the berries are red they are ripe.

Mr. Minkler—I think one of our most extensive strawberry patches is at Aurora, and belongs to Mr. Sims. He has raised the fourth crop of the Wilson's Albany on the same ground. He is perfectly satisfied that he gets a good crop every year.

Mr. Minier—Are they not a poor berry to keep.

Mr. Minkler—I think they keep long enough to market in Chicago.

Mr. Minier—If a bushel of them were sent to my house they would not keep two hours!

Mr. Wilson—A neighbor has in the whereabouts of fifteen acres that have been in successful bearing for three years. During the last season he told me that he had the best crop he has had during the time they have been bearing. Of all the strawberries, his decided preference is for the Wilson's Albany. He told me he thought he would realize from his last crop $8,000.

Mr. Coleman—In regard to the quality of Wilson's Albany, I think it is better for general cultivation than all the rest of them.

Mr. Huggins—I don't like to encourage negligence in cultivating, but it may not be amiss to state my experience in raising Wilson's Albany during the last four years. I have a patch of them—from half to three-quarters of an acre. This is the fourth year, and they bore well. I neglected the cultivation of that ground. Nothing has been done to it except to mow the weeds. The profits from the Wilson's Albany, on that piece of ground, during the last season, was two hundred dollars.

Mr. Foster—I have seen this strawberry upon very different soils. My neighbor has succeeded on hard yellow land in raising the Wilson's Albany. He mulches them in the fall with straw, and keeps off many of the runners.

My brother in Chicago has a piece of land that is black muck, where there was a wet bog, and the Wilson's Albany does well there. I think we can raise the Wilson's Albany on any kind of soil.

Dr. Hull—I notice that one thing has been kept quiet, and that is, the largest berries are usually decayed—at least such is the case in our region. [A voice—Just as fence boards rot because they

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are pushed down into the ground.] I don't know whether this is general or not.

Mr. Galusha—If the gentleman cultivates with straw, I think there will be no trouble.

Mr. ———If we mulch with straw we get seeds. I think slough grass is better. I think the rotting is caused by the bunches laying upon the ground.

Mr. Edwards—It may not be convenient to get slough grass. I make use of corn stalks for mulching strawberries.

Mr. Williams—I will also state that I use corn-stalks, and consider them as good as any mulching I have found. When so mulched, I have found the second crop better than the first.

Mr. Durley—My experience is that they only last about three weeks.

The President—The question is upon the recommendation of the Wilson's Albany for general or universal cultivation.

Recommended, with but one dissenting voice.

Mr. Long, of Mt. Carroll—I would like to ask if any gentleman has been in the habit of raising Russell's Prolific?

Mr. Galusha—I hope no man will answer that question, as we are making up a list for general cultivation; and there is no use in consuming time in discussing the merits of strawberries that have not been well known.

Mr. Overman—I would recommend the Hudson for family use. [A voice—There are two or three varieties called the Hudson; which do you mean?] The old Hudson that has been so long known in the Cincinnati market. [A voice—How large do they get?] They are not quite as large a berry as the Wilson's Albany, but they are much more mild and less acid, and I think better to eat off the vine. They last longer than the Wilson's Albany. It ripens a little earlier, and ripens gradually.

Mr. Shepherd—Have you ever had any worth gathering after the first picking? Was not the second picking very small?

Mr. Overman—They keep up their size better than any other strawberry that I know of. They are not entirely diminutive.

Mr. McWhorter—I think there are two varieties pretty widely disseminated as the Hudson. I was on Mr. Overman's ground when the berries were in bearing, and I believe them to be the Willey, of Ohio. It is a firmer berry than that known to many of you as the Hudson. I think you are not all talking about the same berry.

Dr. Hull—We have had the Hudson, of Cincinnati, growing in our vicinity. We have also had the Hudson, of New York, resembling a great deal the Cincinnati variety. We have discarded them some time since. Better berries have taken their place.

Mr. Galusha—I have had the Hudson from different sources, and cultivated it perhaps for ten years before I threw it away entirely. For the last four or five years I have not had it, and don't expect

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to have it again. It is a pretty good berry, but it does not bear well. I object to the Hudson going on this list.

Mr. Overman—It will not bear cultivation. I recommend it as a berry that will take care of itself.

The President—The question is—Shall the Hudson be recommended for general cultivation? Lost.

Mr. Galusha—I move that the Iowa be added to the list.

Dr. Hull—I would be in favor of recommending the Iowa on account of its being so early.

Mr. Marsh—It bears about two-thirds as much as the Wilson's Albany. It is very bright, and firm enough for a good market berry. It is four or five, perhaps six, days earlier than the Wilson's Albany.

Mr. Bryant—I have had two varieties under the name of the Iowa. One a staminate plant, used for fertilizing pistillate varieties—a rampant grower, but unproductive—sometimes, though rarely, bearing a moderate crop. The other of less vigorous growth, but productive.

Mr. Tice, of St. Louis—I have had some experience with the Iowa. It has done better with me than any other variety. I have never failed to have it ripen by the 10th of May—it has sometimes ripened even as early as the 2d of May. I have had it under cultivation for ten years.

Mr. Kelsey—I think the Iowa is the best early strawberry we can place on the list for general cultivation. It is a most rampant grower. People can plant them, and then let them alone, and have plenty of berries. They will bear negligence.

Mr. Galusha—We, as a body, ought to be above encouraging negligence.

Mr. Shepherd—I confess that I begin to feel somewhat terrified to see that gentlemen are encouraging so much negligence. What we want to encourage is good culture.

The President—The question is—Shall the Iowa be recommended for general cultivation? Carried.

Adjourned till 9 o'clock to morrow morning.

SECOND DAY—MORNING SESSION.

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Mr. Bryant—I think the White Dutch is altogether superior as to the quality of the berry. It is quite as productive as the White Grape. I would prefer having that added.

Mr. Baldwin—The White Dutch is not quite so large as the White Grape, but it is more productive, and nearly as large.

Mr. Phœnix—I have never known anybody who had tried the White Grape who was not delighted with it in all respects. As to the flavor, it is possible that it is not quite as sweet as the White Dutch, but it is really a better berry and a heavier bearer. With me it has done much better than the White Dutch.

Mr. Bryant—I believe that the only reason why the White Grape has ever done better than the White Dutch is because more pains have been bestowed upon it. The White Grape, with the same cultivation, will do no better than the White Dutch; and is not so thrifty.

Mr. Phœnix—The White Grape is a slower grower than the White Dutch.

Mr. Shaw—I shall oppose putting any white currant that I am acquainted with on the list. The red currant is better, except for making a delicate white jelly.

Mr. Minier—I am in favor of adding the White Grape currant to the list, and I am unwilling to give up having some white currants on the list. It may be that the white currant that I have called White Grape is the White Dutch. If it is the White Dutch it is the best Dutchman I have ever met.

Mr. Foster—I would inquire which is the most profitable to market? We prefer the white currant on our table. In the small markets the people don't know much about the white currants; but in the more extensive markets, they may know more about them.

Mr. Bryant—I believe it was not expected that the white currant would take the place of the red. But if the people want a white currant for jelly, or for the table or any other purpose, it is incumbent on us to recommend the one we consider best.

Mr. Phœnix—The white currant is more mild, and requires less sugar than the red, and as you have voted down the White Grape Currant, I think the White Dutch had better be added.

Mr. Long—I have been raising the White Grape currant, together with other varieties, for six or eight years. I consider it the best addition to my currant orchard. With a little care after you get the brush to growing, it produces the most enormously large currants I ever saw. It makes a beautiful white wine, and I prefer it for the table. It is certainly a currant which will take with every man who raises it right. It will grow with the Red Dutch. The White Grape is certainly a very great addition to the currant list. All those in my neighborhood have decided in the same way. I would recommend it as the second currant on the list for general cultivation. By cultivating it you can fat it up and

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make it very large. It is certainly a currant that no man will part with after he gets to raising it.

The vote by which the White Grape currant was originally lost was reconsidered, and it was recommended for general cultivation.

Mr. Bryant—I move that the Victoria currant be added—not that it is superior in any respect to the Red Dutch. It is quite as large, and it has the advantage of continuing longer than any other currant that I know of. The bushes are very vigorous and very productive, and grow two or three times as large as any other currant.

Mr. Phœnix—Don't you consider them a very slow grower?

Mr. Bryant—I do not consider the genuine Victoria a slow grower by any means. It is a very rapid grower. I picked out what I believe, from the descriptions which I saw, the genuine kind. I have had two other kinds, which some call the Victoria, which are slow growers and very sour. But that which I suppose to be the genuine Victoria is late, and a very vigorous grower. The bushes are at least three times as large as the Red Dutch, planted at the same time. It is quite as great a bearer as the Red Dutch.

Mr. Long—I have also raised that currant, and my experience accords with Mr. Bryant's. It is a good grower, but there is nothing to recommend the Victoria but its being late. It hangs upon the bushes well. It is a very sour currant. I have had it in the last of July. I can't say that I would recommend it for general cultivation.

Mr. Edwards—I have grown the Victoria for a number of years. It is a very vigorous, thrifty bush. With me it bears well, and ripens some ten days later than the Red Dutch. It is valuable on account of its lateness.

Mr. Phœnix—If it is a fast grower, I have got to learn what I have learned over again. That and the White Grape are very slow growers with me. The first year from the cutting, if you can get from two to five inches against eight to twelve with the Red Dutch, you are doing well. [A voice—What kind of bunches does it grow?] The Victoria has long bunches, and of a very light, beautiful color.

Mr. Edwards—I spoke of the Victoria as a very vigorous grower. It may be partly owing to cultivation. I always manure highly. It does not grow so rapidly at first, but when it gets to a bearing age it grows very vigorously, and the bushes are very stout.

The Presiding Officer—The question is—Shall the Victoria be added to the list? It was added.

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tionable on account of the difficulty of keeping the bushes off of the ground. The American Seedling grows upright.

Mr. Galusha—I have been growing both varieties. The fruit of the Cluster is tough and very acid. We never make any use of it. It is more acid than Houghton's, and when it gets ripe it is tough. We have never made any use of them, though we have grown them by the bushel.

Mr. Huggins—My experience is somewhat different from that of Mr. Galusha's. I find that my customers object to the Houghton because it trails on the ground. My wife has a row of the Upright Cluster that she always requests me to save.

Mr. Kelsey—I have known them both for ten years. When I first commenced cultivating them I thought I preferred the Upright Cluster or American Seedling. Now I do not plant the Cluster for fruit. The Houghton is larger, and bears equally well. I have known it in several places and it bears well wherever I have seen it. I think there are very few who will use the Cluster if they can get the Houghton.

Mr. Weir—I have them growing side by side, and find that the Houghton mildews, while the Cluster does not.

Mr. Fell—I have the Cluster growing by the side of the Houghton, and the Cluster in this region is not as free from mildew as the Houghton. The liability to mildew has condemned the Cluster with me.

Mr. Williams—With me the Houghton invariably mildews. The Cluster is very productive, and never mildews.

Mr. Weir—I have never known the Cluster to mildew on sandy soil.

Mr. Bryant—I have the Cluster and the Houghton. I have never known the Houghton in but one instance to mildew. The bushes are generally as well stocked with berries, quite as well, as the Cluster. The Houghton seedling is a trailing bush, and it is often allowed to remain too long without pruning, but with proper attention it is altogether preferable to the Cluster.

Mr. Shaw—The gentleman from Macoupin spoke of the Cluster as not being a profitable bearer, and not paying for gathering. We can gather them in our county for a little more than one cent per quart.

Mr. Edwards—I will take one moment to state our mode of gathering gooseberries. We began with the tin scoop, but we have laid that aside. We now take a pair of thick buckskin gloves and grasp the bushes firmly, and strip off the berries on a given branch at one time. [A voice—What do you do with the leaves?] Clean them out by fanning.

Mr. Kelsey—I want to know if the Cluster is the same as the American Seedling? [A voice—The Houghton Seedling has been called the American Seedling.] I think the true American Seedling is the Cluster. [A voice—The Cluster and the American Seedling are the same.]

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Mr. Baldwin—I believe they are very much mixed in cultivating. The habits of the bushes are a little different. One grows upright and the other is straggling. One has a thinner skinned berry than the other. The trailing one has a thinner skin. I think they are very much mixed through the country.

Mr. Weir—There are three distinct varieties.

Mr. Edwards—Mine are the kind grown so extensively in Cincinnati.

The President—The question is on the recommendation of the Cluster for general cultivation. Carried.

RASPBERRIES.

Mr. Shaw—The Doolittle variety is one of the most profitable. I move the adoption of the Doolittle Black Cap. Carried.

Mr. Overman—I move the Purple Cane. Carried.

Dr. Long, of Alton—I move to add the Ohio Ever-bearing.

Mr. Overman—That name would do if the *ever* had an *n* before it. It never bears with me.

Dr. Long—It is a good bearer with me.

Mr. Huggins—It bears well with me; it is a good berry and very profitable.

Mr. Ratcliffe—It is *the* bearer in my section.

Mr. Phœnix—It is a good bearer when properly cultivated.

Mr. Weir—I can't get one good crop from it.

Mr. Huggins—My experience is different. I get one full crop at the usual time on the stocks that live through the winter. The new stocks form green fruit in the course of a month. I might say, correctly, the new stocks bear another full crop. That is universally the case with me.

Dr. Hull—My experience coincides with Mr. Huggins'. The sprouts come up, and as they reach maturity, the end is terminated with fruit. It is absolutely necessary to have high cultivation.

Mr. Long—Mr. ———, who has had an extensive and profitable experience with raspberries, told me, about a week ago, that he was going to take up every thing except the Ohio Ever-bearing. He said they always did well, and that he should extend his plantation of the Ever-bearing. They are a rank grower. It pays to cultivate them well.

Mr. McWhorter—I wish to know whether to secure fruit most successfully the stocks should be cut back. Some say they should be cut to half lengths, or even lower.

Dr. Hull—They should be cut to be three or four feet.

Mr. Durley—They require cultivation with me, but when cultivated they produce well. I have a number of raspberries in cultivation; but I have none that I esteem more than this berry. I have Doolittle's Black Cap and several other varieties, but I have none that bears better than the Ohio Ever-bearing.

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Mr. Huggins—I would like to inquire if good cultivation is absolutely necessary.

Mr. Durley—It is necessary that all raspberries should have good cultivation.

Mr. Phœnix—It will fruit one crop without cultivation; after that it needs cultivation.

Dr. Schrœder—I have cultivated the Ohio Ever-bearing for four or five years; part of them I have not cultivated much. Some of them I have neglected so badly that I suppose good cultivators would say they were not cultivated at all. They have borne a good crop in the fore part of the season, and have continued to bear a good many berries. I have another kind of ever-bearing raspberries that I should think ought to be termed never bearing.

Mr. Spalding—I have cultivated the Ohio Ever-bearing a great deal; it has become a great favorite in my section. It bears the whole year—comparatively speaking. In dry weather there is not much of a crop. But when well cultivated in favorable seasons, it does well. Nobody who has cultivated it will condemn it. It is strictly an ever-bearer.

Dr. Schrœder—I would like to ask the gentleman how the fruit looks.

Mr. Spalding—It is nearly the color of the common blackberry.

Mr. Shaw—They have been cultivating it sixteen or seventeen years in our section, but when we go into the market we find none of the berries.

The further discussion of the raspberry was discontinued.

BLACKBERRY.

Mr. Shaw—I should recommend the Dorchester.

Mr. Galusha—The only objection that has ever been made to it is that it has not proved so hardy as some of the other varieties. With a little care and protection it will do well; but it has to be cared for. A gentleman near Dixon has grown it very successfully. I saw the largest crop there that I ever saw. One little plant that I had produced fruit enough to come to fifty cents. It requires but little care.

Dr. Hull—The Lawton is in favor with all. I move the Lawton be recommended for general cultivation.

Mr. Hausen—* * The manner in which I protect blackberries is with corn stalks. I have no difficulty in getting a good crop every year. [Question—Do you cut them back?] Yes, I cut them back about the first of August. [Question—How do you get them down to cover them?] I put the stalks around them like a corn shock—very open. They require but little protection. [Question—How many years have you been cultivating them?] Six or seven. [Question—How far apart do you put the hills?] I put them five or six feet apart. [Question—How many stocks in a hill?] I put three or four stocks in a hill. One is enough to start on.

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The President—The question is upon the motion of Dr. Hull to recommend the Lawton Blackberry for general cultivation.

Carried.

MULBERRY.

Dr. Schrœder—I would recommend Downing's Ever Bearing Mulberry. It is wonderfully hardy. It is the only mulberry I cultivate.

Mr. Bryant—I have cultivated our wild mulberry. The native mulberry may be greatly improved by cultivation. I found when I lived near Jacksonville, a variety growing in the woods near that place, from the seed of which I raised trees. These trees have produced fruit, and the fruit is much of it an inch and a half in length. The only trouble in getting a crop is that the birds are very fond of the fruit, and are apt to take it as fast as it ripens, unless raised in great quantity. As a market fruit I don't know that we had better recommend it for general cultivation. These trees of the native mulberry frequently spring up in my nursery wherever the birds scatter the seed. The young plants are springing up in large quantity wherever they are safe from the attack of cattle and sheep. The fruit is esteemed for eating in its native state, and likewise for cookery. The tree bears very young. There are some trees which never produce fruit. They will bear when they are about three years old. It is a rapid grower; it will get up to six or eight feet from the seed in three years.

Dr. Long—I move that the Red Mulberry of the forest be recommended for cultivation.

The President—You are aware that there are two varieties—the red and the black. The black is more sweet and comes into bearing earlier than the red.

Mr. Bryant—I would say that the Black Mulberry is an European tree, quite distinct from the native, and not very hardy.

Mr. Long—As for raising the Red Mulberry for fruit, I would just as soon think of raising the elm, except you want to bait birds around. They will leave other fruits for the mulberry. I would not raise the Red Mulberry for the profit of the fruit, but if you want forest protectors take the mulberry. You will not get a better from the forests of Illinois. It grows very rapidly in good ground, and it requires good ground. When it is grown it makes good posts, that are next best to cedar. You may turn it to almost any account. It makes excellent firewood, and for posts it is certainly one of the most valuable trees Illinois produces.

Mr. Bryant—It is a very ornamental shade tree. In regard to its value for posts, I suppose it is not inferior to the Red Cedar in any respect. I was assured some years since, by one who had seen it, that near an old church in North Bridgewater, Mass., there was a mulberry post which had stood there for seventy years.

Mr. Snedecker—My neighbor has a mulberry taken from the forest. He undertook to put out mulberries for making silk, but

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his selections from the forest are the best for bearing. There are mulberry trees that produce from ten to twenty bushels of berries to the tree. There is one that has berries on from June to September. He tells me that he believes there is nothing he can raise on his farm that will feed as many hogs as those mulberries. This particular kind of continual bearers is a large black mulberry. It is valuable for timber, for fruit, and valuable for feeding hogs.

Dr. Hull—I have three sorts, including the one under discussion, and would be very thankful to the advocates of the mulberry it they would come and take them away.

The vote being taken on recommending the Red Mulberry for general cultivation, (as a fruit tree,) was decided in the negative.

GRAPES.

After some sparring as to how best to proceed with the discussion, on motion, the Concord was taken up and discussed as a grape for general cultivation.

Speakers were limited to two minutes each.

Mr. Redfield—The Concord is overdone. I say that all who recommend it for the million will never be thanked for it I say that you are risking the reputation of this body as horticulturists in recommending it for the million.

Dr. Andrews—This Society has recommended that grape for two or three years. I would like to have the question discussed. I should be opposed to having the Society recommend this grape as a first quality grape. It does not do very well at Rockford, but it is good in its place. It is a very fine growing grape, and produces with very little care, and matures early, which is an object, as the grape season is short. It produces very abundantly, and the grape is of very good quality. I hope the Society will recommend it.

Dr. Schrœder—Grapes that do well in one place may not do well two hundred miles north or south, and sometimes they will not do well in the same vicinity if planted on different soils. Mr. Koch I consider our great grape king. He writes me that the Concord is not worth a snap in Pope county. I have got letters from other persons down south, that it is not good. I have letters from the north part of the State and from Michigan, and it is good there. We should talk about the soil for the Concord and the best localities. It should be considered whether we should recommend it for all the districts, or only for certain districts. We should talk about what is the best soil. I have no doubt, as our honorable member Dr. Andrews said, that the Concord is not the grape for Rockford, but that it is good in its place.

Mr. Weir—Out of a hundred varieties, the Concord is the only grape I can recommend for all kinds of soil in my neighborhood. The Concord does well universally in my vicinity. I have never seen a rotten grape on it in my neighborhood in five years.

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Mr. Smith, of DesMoines—I think it is a good grape, and have great demand for the plant. I think it is a good thing to sell.

Mr. Bubach—In my vicinity the Concord seems to do very well. I have fruited it for five years, together with quite a number of others. We consider it one of our best and most profitable grapes. We have always considered it equal to the Isabella. The season varies very much, and sometimes Isabella and Catawba do not mature, but the Concord ripens every year, and is always an excellent grape. I think the demand for it is greater than for any other variety in the market. It is a very prolific bearer, and does not winter-kill so easily as most other varieties. As regards the keeping property of the fruit, it is good. We have had it in use for the last two months, and I cannot see but the taste or quality is as good as when it first matured. For general cultivation I should consider it equal, if not superior, to any other grape. I certainly have nothing that I think is better. The majority of seasons it is better than the Isabella. Very many seasons the Isabella does not ripen.

Mr. Galusha—I had some friends visit me from Rochester, N. Y. We set a large dish of these grapes before them, and they were highly pleased with them. The lady asked me what they were, and remarked that they were very fine. I told her I would like her husband's opinion of them. After eating of it he said he preferred it to the Isabella. I do not myself think the Concord is equal in flavor to the Catawba, or some of the other varieties of grapes when they are fully matured.

Mr. Weir—I dont think that we, as horticulturists, should recommend it as the best flavored grape; but, all things considered, it is the best grape for the million. Perhaps it is not so good to eat as the Catawba, but it is good. It is easily propagated, and is the vine for the million.

The President—The question is upon the recommendation of the Concord for general cultivation. Carried.

Mr. Waterman—I recommend to take up the Hartford Prolific for discussion.

Dr. Schrœder—It is an early table grape and profitable, especially to those who live near St. Louis, where it sells very readily.

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unfortunate, and had some bad luck with it at first, and condemned it, but I now take that all back. I say let us have the Delaware.

The President—The question is upon the recommendation of the Delaware for general cultivation. Carried.

Mr. Hammond—I move the Diana be added to the list for general cultivation.

Mr. Weir—I could not vote for it for general cultivation. It is the only grape I have that has rotted on my soil. It is very tender; it kills both in the tops and roots. It might do for the southern part of the State, but will not do in the northern part.

Mr. Evans—In Lower Egypt the Diana grape seldom matures.

Mr. McWhorter—It seems that the object is to recommend a list for general and extensive cultivation. If we proceed in this way I fear we shall commit some blunder that we shall be sorry for. I believe it is the conviction of nineteen-twentieths that the Concord is about the only grape that should be recommended for general and extensive cultivation. If all these varieties are to go on to the list, under the same head, for general cultivation, I fear we shall make a mistake that will mislead many.

Mr. Trask—Some of the people want to cultivate some few varieties for table and family use, and we want you to recommend to us such a list as we can take hold of with a hearty good will, and cultivate with certainty of being rewarded for our labor and expense. We want a list of fruits that have been and can be successfully grown by the masses.

Mr. Minier—The great want is a list of fruit, from the strawberry up to the apple, that the people can cultivate. We want a small list that the people can cultivate with security. We are here to benefit the people, and not to grind axes.

Dr. Andrews—In northern Illinois the Diana is so firmly established that it would be difficult for any vote of this Society to throw it out. It ripens early and its season is long. We apprehend that it is a better grape than any other we have to keep through the winter. We can get it from the vines every week through the autumnal months. I think it has the reputation of keeping better than any other grape we have. The qualities I speak of certainly recommend it. [Question—What kind of soil do you grow it on?] On all kinds of soil that we have in the north part of the State. [Question—Is it not apt to rot?] I am not aware that the rot affects it as far north as Rockford. In regard to its being tender, I would say that we have to cover all our grapes there. We can keep the Diana in that way. We only give it a slight covering.

Mr. Hammond—The fact that the Diana is one of our best keeping grapes, is one of the reasons why I would recommend it. If we plant only the Concord, the grape season is soon over. I have kept the Diana all winter.

Mr. Douglass—I know of two places in northern Illinois where the Diana does well. One is on the bluffs of the lake shore, and

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the other is at Rockford. On the prairies it kills. It is more tender, I think, than the Isabella. We are looking for a grape for the million, and I think the million would not think much of the Diana—it is too easy to winter-kill.

Mr. Galusha—That remark is likely to mislead. I have had the Diana grape for ten years, and never knew it to winter-kill. I do not regard it as so very tender, although it is perhaps in the same list with the Isabella. Although it possesses many excellent qualities, I dont know that I want to recommend it for general and extensive cultivation.

Mr. Curtis—It does well in the east of the State. I have raised some fifty varieties of grapes, and I think the Diana is the best flavored of all. It is as hardy as the Catawba. It ripens well and keeps well. I think we should recommend it for general cultivation.

The President—The question is upon the motion of Mr. Hammond to add the Diana to the list of grapes for general cultivation. Lost.

Dr. Schrœder—I move to add Norton's Virginia Seedling to the list.

Mr. President: We come now to the king of the wine grapes. The Norton's Virginia Seedling, or Norton's Virginia, as it is sometimes called, is a grape that will grow fast after it has been set out for three years. Though it is not a slow grower, after it gets well to growing, it takes a while for it to get well established. It is as hardy as our common grapes. I think it is nearly as hardy as the Concord. I know that it makes wine superior to any other grape. It is worth four dollars a gallon when the wine of other grapes is worth two. It is a healthy wine—it has some medical properties. The wine is fiery and it will keep well. It weighs from ninety-six to one hundred and three. When the people understand things right, there are many hundreds of persons who will start vineyards.

I say, friends, let us recommend such grapes as will be profitable to the man who wants to make a business out of grape culture, and which are also profitable to the million. I cannot recommend enough the Norton's Virginia. It is a good grape for eating. It is good for all the purposes for which we want the grape. The only trouble is that the birds are too fond of it. Whatever fruit the birds will take is always good. They always go in for the best. But while it is so good for other purposes, it is our best wine grape, and I say again, let us recommend good wine grapes—something that will make you feel good. I recommend with good heart Norton's Virginia.

Mr. Weir—Dr. Schrœder's speaking of the Norton's Virginia as being a good grape for eating, reminds me that I have heard of children in Germany crying for pickles, the same as our children

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cry for candy. That same taste probably accounts for the Doctor's opinion that the Norton's Virginia is a good grape to eat.

Mr. Eisenmeyer—My brother and myself have quite a variety of grapes. Much of the ground which has heretofore been occupied with other kinds we shall use hereafter for Norton's Virginia. From experience we esteem it as highly as any grape vine. We have many varieties of grapes on different soils, but none as profitable as the Virginia Seedling. During an experience of four years I have never seen any mildew or rot. It produces well. It is a general complaint that it produces somewhat less than other grapes, but it is considered among the best of wine grapes, with clean raising. It makes an excellent wine, and a wine that always commands a high price in the market. [Question—Do you make wine without sugar?] Yes, sir: but it must be the pure juice. If you use sugar there should be water put in it.

Mr. Flagg—It is an old saying that "good wine needs no bush." I should say that is the case with wine made from the Norton's Virginia. As regards the Norton's Virginia, I do not know its quality in the northern and central parts of the State, but in southern Illinois, and in Missouri, I know it is considered *the* grape for wine. It is second to none in my estimation, where I have seen it, for a wine grape. So far as I can judge of wines, it makes the best wine for American taste. It is not so acid as some of the wines. It is a very excellent wine for medicinal purposes. It has a very healthy vine, and the strength of the wine, and its high market value, makes up for what it lacks in productiveness. At Hermann, Mo., it is considered the most profitable grape they raise, not even excepting the Concord. That is all the testimony I have to bear to it. In brief, it is the most profitable of all the grapes. For a table grape I don't like it as well as the Catawba, but when fully ripe I like it nearly as well as the Clinton.

Mr. Eisenmeyer—In regard to the ripening, it is a grape that can hang on the vines the longest of any.

Dr. Schrœder—Norton's Virginia comes in bloom at least three weeks later than the Catawba.

The President—The question is upon the recommendation of Norton's Virginia as a wine grape for general and extensive cultivation. Carried.

Mr. Flagg—I move the Clinton be recommended for general cultivation.

Dr. Schrœder—The Clinton is a red wine grape. It should bear on the laterals. It has a very delicate vine. I would not recommend it for a table grape, but as a wine grape I can recommend it heartily. As a grower, it is very hardy, and stands a great amount of negligence. It would be a very good grape for an American. Let it throw out laterals, and leave only from three to six eyes, and it will do better than any other way. Thirteen pounds of the grapes make a gallon of wine.

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Mr. Weir—I think it will mark twenty-three per cent. higher than any other grape.

Mr. Flagg—I would like to make one remark in favor of the Clinton. I think it is one of the hardiest grapes we have. It is a good table grape, and a good wine grape.

Mr. Husmann—In regard to the hardiness of the Clinton, I would say that of many varieties we had exposed last winter, it is the only one that was not killed. If it is left to hang late on the vines it is a good grape.

Mr. Weir—It is the best grape for the kitchen—for pies, jellies, etc.

Dr. Andrews—It is the only grape that failed in Northern Illinois this season. The vines did not kill, but the fruit buds were all killed. It entirely failed in the northern tier of counties; but when it succeeds, it is one of the most desirable family grapes.

Mr. Husmann—I would state that I have raised the Clinton grape for twenty-five years, and have never protected it until last season, I threw them down. I have never protected them before. Some five or six years ago I lost a crop with mildew. [Question—Have you ever kept them through the winter?] I have put them up between layers of cotton and kept them quite a while, but we have used them up before the winter was over. [Question—Was the flavor better after they were kept than when first put up?] Yes, sir.

Mr. Galusha—I think the Clinton is more widely known than any other one variety, except, perhaps, the Catawba; and I don't know that I should except that. I have grown the Clinton longer than any other variety. I do not esteem it of good quality for a table grape. I have never tried keeping it.

Mr. McWhorter—If kept, it is a very good table grape. It certainly possesses qualities which ought to influence everybody to plant it. Everybody can get wagon loads of these grapes without much cultivation. A single vine will bear wagon loads without pruning. I think it should be placed on the list for general cultivation.

Mr. Marsh—It sells for so low a price that it hardly ever comes into market.

Mr. Flagg—It is the testimony of gentlemen from Alton, that it brings a very remunerative price. It has proved very hardy. The Clinton is the only grape that produced a full crop this season, in some localities.

Dr. Andrews—It has been suggested that a wagon load of grapes could be raised on one vine. Raise a wagon load of grapes on one vine, and they will not be very large or very marketable. The Clinton can be raised, by proper cultivation, to be twice as large as those generally found in the market.

The Clinton was recommended for general cultivation as a wine grape.

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CHERRIES.

Mr. Flagg moved the Early Richmond be recommended for general cultivation. Carried.

PEARS.

The White Doyenne and Flemish Beauty were recommended for general cultivation without discussion.

The Seckel being proposed, was very briefly discussed.

Mr. Spaulding—The Seckel grows larger and does better in Illinois than in many other places. I believe that none of our good gardeners will try to get along without the Seckel.

Mr. Douglas—I tasted them East, last year, and also in Illinois, and I think they were better in Illinois than in New York.

Mr. Edwards, of La Moille—I have some half dozen trees that have borne a number of years, and it seems as hardy as our apple trees. If I could plant but one pear, I would plant the Seckel.

Mr. Snedecker—In Southern Illinois it is a most excellent pear; and no pear bears better.

Mr. Galusha—I bought some of the Seckel pears, and took them home; and they were not considered equal to the White Doyenne. They are not of first rate quality everywhere.

Mr. Shepherd—I have cultivated them quite expensively—not extensively. I have given them what I consider the best cultivation, and have had them from the size of an acorn to the size of a goose egg. I had one that I think was three inches in diameter, and four inches in length. The tree is as hardy as any other pear tree I have cultivated. As to the quality of the fruit when produced, I have raised twenty varieties that I consider superior to the perishable quality of its fruit when produced. [Question—What is the soil?] I have tried them on every thing, from a rich soil to an almost drifting sand. [Question—Do you gather them and let them ripen in the house?] It is common in my neighborhood. I have found them better ripened on the tree than in the house. I have had as good fruit ripened on the tree as in any other way.

The question being taken upon adding the Seckel pear to the list, it was decided in the affirmative.

The Duchess d'Angouleme, Louis Bonne de Jersey, Easter Buerre, Bartlett and Belle Lucrative were added without debate.

QUINCES.

The Orange Quince was, without debate, recommended for general cultivation.

PEARS AGAIN.

Dr. Hull—I move to reconsider the vote by which the Bloodgood was lost, and to add it to the list of pears. I have one of these trees that is about twenty years old, it bears well, but is on good soil.

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Mr. Bryant—I have fruited it. It is barely a tolerably good pear. We have a list that is already sufficiently extensive. Why need we go on recommending all these pears when we have so long a list, when we have already recommended more than it is an object for any man to cultivate.

Motion to reconsider the vote on the Bloodgood lost.

Osband's Summer was proposed and recommended for general cultivation.

Mr. Edwards, of La Moille—I have got only about a hundred varieties of pears. I planted the most of them twelve or fourteen years ago. I lost most of the varieties some eight years ago. Since then I have fruited a number of kinds, and pears are gaining in my estimation. A few years ago people would come to me to buy pear trees and I dissuaded them from buying them. Of late years I have had men come to me and blame me for the advice I gave them. If my life is spared I am going to extend my pear orchard.

Mr. Durley—I have cultivated pears for fifteen years. I have raised probably thirty different varieties of all the choicest kinds I could obtain. I will just say that I have not now a half dozen varieties living. I have taken great pains in cultivating them, and have done all I know how to do, to make the raising of them a success. So far as our locality is concerned the pear does not succeed.

Mr. Huggins moved to recommend the Glout Morceau for general cultivation.

Mr. Edwards, of La Moille—The list of pears seems large; it is; and yet, we have not recommended over three per cent. of the pears in cultivation. On the soil that Mr. Durley has tried them, I would not recommend any man to cultivate pears. But on clay soil, well protected, I would recommend the cultivation of the pear.

The Glout Morceau was added to the list.

SECOND DAY—EVENING SESSION.

The subject of apples having already occupied much attention without satisfactory result, it was decided to appoint a committee to select a list of apples for general cultivation, comprising summer, fall and winter varieties. The following was [illegible]

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THE AGRICULTURAL COLLEGE.

This subject was placed on the programme for this evening. There being but little difference of opinion, it was thought best to spend but little time over it. A committee for the purpose, reported the following preamble and resolution, which were unanimously passed:

WHEREAS, the Mechanic Arts and Agriculture are so nearly related in practice, and so mutually dependent, that the best interests of those engaged in both those pursuits, demand, so far as possible, the education of pupils designed for these associations to be conducted in association with each other;

And whereas, the expression of opinion by every public convention and every organized body which has discussed and considered this subject for the past eighteen years in this State, has been uniformly and strongly in favor of preserving an intimate association and entire unity in the educational training of the pupils referred to, in the most deliberate and positive manner; therefore,

Resolved, That we hereby re-affirm the resolution passed by the convention held at Decatur during the late State Fair, and insist that to divide the endowment fund granted by Congress, and appropriate it to two or more Institutions, which shall provide but in part the departments and course of study contemplated by the Act of Congress, approved July 2, 1862, will be not only a palpable perversion of that grant, and in direct violation of its clear and explicit terms, but will defeat and destroy the crowning excellence of an Industrial University worthy of the State and the nation.

ORNITHOLOGY.

Mr. E. A. Clifford read the following paper on "Birds Injurious and Beneficial to the Horticulturist":

Charges are brought against the Butcher Birds, or "Shrikes." We have three species in our State. When young, they are said to eat small fruits, with caterpillars, etc. But the worst charge against them is their cruelty to the warblers and our best canaries. If you hang a cage outside on the porch or side of the house, they are sure to be on hand to pounce upon it, and they succeed nearly every time in getting some of the occupants. I advocate their destruction, because of their killing so many of the small birds, that are our friends.

The Blue Jay, *Cyanurus Cristatus*, is omniverous, and lives indiscriminately on all kinds of insects and flesh. It is one of the noisiest birds—domineering and boisterous in its manner to the other birds. It is always making a tumult, and is mean and skulking in its ways. It sucks the eggs from the nests of the other birds. They committed depredations on my grapes, and I think they are a lover of blackberries. They are fond of thieving when tame, and like the Magpies, take to hiding away bright and shining articles.

The Orchard Oriole, *Icterus Spurious*, may be regarded by some as injurious, but taking into consideration the vast quantities of insects and larvæ it devours, I think that the help it renders us in this way, more than balances and makes up for the offences it commits on the small fruits.

The Cat Bird, *Mimius Carolinensis*, appears to be fond of grapes, blackberries, and some say strawberries. I think he takes blackberries and grapes quite frequently.

The *Ampelis Cedrorum*, Cedar Bird, is very annoying to the

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grower of fine cherries. They sometimes lay waste an entire crop of them. I have frequently shot ten or twelve at a shot while they were engaged on a cherry tree. They are moderately fond of strawberries and raspberries, and, I think I have caught them regaling themselves on blackberries. Mr. Wilson, of Winetka, informed me that they peck into apples to get the seeds, and that one year they did him great damage.

But the worst bird, and the one that does the most harm to the Horticulturist, is the *Sphyrapicus Varius*, commonly known to you as the Sapsucker, or Yellow-billed Woodpecker, and I call him a bark-eater. He does worse than eat the fruits; he strikes at the vitality, the very living of the tree. In other words, he cuts off the supplies by drawing off the sap and eating the bark.

Now, I would not have you confound or mistake the Hairy Woodpecker, *Picus Villosus*, or the Downy Woodpecker, *Picus Pubescens*, with this one, for they are our friends; they are beneficial to the fruit grower, as they eat up large quantities of insects and larvæ.

The Yellow-bellied Woodpecker or Barkeater, quite frequently peels off the bark from the apple and the Scotch and the Austrian pines, in spots as large as the palm of my hand. I have seen him girdle an apple tree, and a healthy one at that. He makes the apple, Scotch and Austrian pine, spruce, pear, silver poplars, cherry, maple, basswood, and some other trees, the base of operations.

I had hoped to have seen my learned English friend and logician before me—I mean the would-be champion of the Sapsucker—so that he might hear the facts of the case, and be "convinced."

In April, 1860, in an article in the *Prairie Farmer*, I gave my ideas and examinations on the subject. A little later I made a drawing from nature; it, also, appeared in the *Prairie Farmer*, with a proper description attached, so that it might not be mixed with the two species I have just mentioned.

Dr. John A. Kennicott, a gentleman well-known, generally, a man whose scientific knowledge and veracity none can doubt for a moment, confirmed my statements to be true, by writing me that he had had them shot while in the act of barking trees, and dissected them while warm, and that he fully agreed with me in all I had said. I dissected twenty-five or thirty, and examined their stomachs, both by the naked eye and under the microscope, and I have never as yet found but one solitary larva, but bark and sap were in abundance. Mr. Peck, of Winetka, said it was very injurious to him.

In 1862, Dr. P. R. Hoy, of Racine, Wisconsin, delivered an address before this Society at Chicago, in which he fully sustained the bad character of the bird.

The anatomy of the tongue in the *Picus Pubescens* and *Villosus* is entirely different from the *Sphyrapicus Varius*. In the former species it protrudes beyond the end of the bill, and is barbed. It is just the thing for spearing worms and insects. In the latter spe-

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cies the tongue is not protruded much beyond the end of the bill, and is much more blunt and rounded than in either of the former species.

I think there can be no doubt in the mind of any one that investigates the subject to any extent, as to its injurious propensities.

The birds that I would encourage are the Swallows, Martins, Wrens, the Downy and Hairy Woodpecker, and especially the Nuthatchers. The latter are great friends of ours, always industrious, and searching over the trees and posts for insects, etc.

A certain Major, of the Germantown Telegraph, says he could not distinguish the Nuthatchers from the Woodpeckers. He must be in a blissful condition. He must be a firm believer in the old saying that "where ignorance is bliss, 'tis folly to be wise."

CULTIVATION OF GRAPES.

On motion of Mr. Weir, this subject was taken up. The time was principally consumed by Dr. Hull, Dr. Andrews and Dr. Schrœder, who illustrated their remarks by diagrams upon the blackboard, and without illustrations, would be of little use to report here. Dr. Hull, afterwards, furnished his method of preparing his ground for and the cultivation of the grape, on the bluffs of his farm, as follows:

I grow my grapes exclusively on side hill land, which is thrown into terraces twelve to eighteen feet wide. I commence near the top of the hill. First mark the upper side with a spade horizontally around the hill, with a slight depression to the points selected for drainage; mark a parallel line as low down the hill as the first terrace is to extend, then with a two-horse, cast-steel, side-hill plow, plow the earth down hill until the upper hill side of the terrace is eighteen inches lowest. The perpendicular side of the terrace should be kept so by the use of a one horse plow and spade. Now let us suppose the perpendicular bank at the upper side of the terrace to be six feet high. With a spade or sharp hoe, commencing back from the summit two feet, making a graded slope to the base, this earth will raise the upper side of the terrace about one foot, with top soil, still leaving the down hill edge about six inches highest, this will incline the water to the hill side, and effectually prevent washing. Continue terracing, as above described, until you reach the base of the hill.

Two men and a team will thoroughly prepare an acre of ground, as described, in from one to two weeks.

I set my vines, the rows six feet apart, and the same distance in the rows; to each vine set three stakes—one at the vine and one on either side, two feet from the center stake. Thus each vine occupies four feet in the rows, leaving a space of two feet between the vines, for pruning, the circulation of air, etc. The stakes should be six feet six inches high; to the top of these nail a continuous slat or bar. To the center stake nail the ends of two laths, say

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three or four inches from the ground; incline these upwards, say three degrees, and nail to the outside stakes. On these slats you are to train two branches, one on each, to and up the outside stakes. These young branches, on reaching the top of the poles, may extend right and left on the continuous bar first described. In the fall, winter, or early spring, both of these canes are to be cut back; one for fruit, to ten eyes, more or less, according to the strength of the vines; the other to three or four eyes. To the center pole was attached the cane that bore fruit; this is cut clean away, and the cane with ten eyes is twisted and wound spirally around the center stake, and tied firmly to it. This is the cane that produces the fruit, and from its position is free from drip or shade from other parts of the vine. The spiral binding and twisting will cause the buds to break evenly, and its position secures full exposure of all its leaves. The cane cut to three or four eyes will push as many shoots as there are buds. Select the two strongest ones to train on the lower slats and up the outside stakes, as before directed. Both the pruning and training will be the same each year. On your fruit cane never grow two leaves where only one can be fully exposed; remember that large fruit and color depend on full development of the leaves, and that competition for sun and air will greatly lessen the value of your crop; hence it is that we recommend three stakes, with only one cane to each.

Clinton, and other sorts which make small bunches of fruit, should, when the vine is capable of carrying more fruit than can be supplied by the true fruit buds, have its laterals cut to three or more buds; the eyes on the strong laterals may thus be taken advantage of to secure a full crop. In describing the first operation of training, it will be remembered that the two arms of the vine diverge right and left from the main stem, within three or four inches of the ground, and when desirable, may easily be laid on the ground, and secured in that position by holding them in contact with the earth by the foot; with a hoe draw a little earth on them to keep them down, and when you have completed the row turn a furrow of earth with a one horse plow over them. In this manner they will winter safely, and may in the spring be raised by thrusting a fork under them and lifting them up.

THIRD DAY—MORNING SESSION.

The Society met at 9 o'clock. Prayer by the Rev. Mr. Read.

PRUNING OF THE APPLE TREE—By M. L. Duklap.

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tree is pruned up to the main branches, which will be a foot to eighteen inches, leaving from three to five, according to the habit of the tree. The next year the tree will do to set in the orchard, though many are left two to three years longer. On putting in the orchard, the branches that would crowd each other are to be cut out to prevent this evil, and the last year's growth cut back to within three or four buds of the old wood. This will make the top correspond to the amount of roots, if the tree has been properly lifted. No further pruning will be required, only to keep down suckers at the base, cut away water sprouts, and an occasional branch that may rub against its fellows. The small twigs and fruit spurs, that are so often cut out by orchardists, should not be disturbed. The low head will shade the trunk and prevent the borer making a lodgment, as this insect prefers the sunny side of a tree in which to lay its eggs, and avoids the shade. Fruit trees are damaged more by excessive pruning than the want of it. Pruning is thus reduced to a very simple process. Thinning out main branches, when the tree is small, will save the cutting away of large ones, that so often produces canker, and the tree becomes enfeebled.

GRAPES.

Mr. Murtfeldt was called upon, and responded substantially as follows:

Gentlemen, I am an amateur. I took some notice of what was said last night, and though I can add but little from my own experience, I can detail to you a little of the experience of my father and brothers, who are grape growers above Newburg, on the Hudson river. Many grape growers seem to lose sight of one particular point; they seem to think that any variety of grape may be adapted to any climate.

The Americans love sweet wines, and should cultivate such grapes as produce them. The grape raising localities in Germany are confined to a very small space of land; but in this country, even in this State, we have a great variety of soil, climate and conditions. We take grapes that can be successfully raised in one locality, and without regard to elevation or change of conditions, expect the same result. This is a great mistake in the growing of the grape. We cannot expect the same quality of grape to grow from the same variety of vines, in all localities, any more than we can expect a given kind of apple to be equally good, without reference to the locality in which we raise them. There are apples raised in the East that are very superior there, but are nearly worthless here. We have tried to get apples suitable to every climate, but have been unable to do so, and now we try to get those adapted to our climate, and we try to get other fruits adapted to our climate. We should do so with the grape.

We have had quite a variety of experiences detailed here. Dr. Andrews said that he had succeeded in raising certain foreign va-

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rieties of grapes, which have generally been a failure upon our soil and in our climate. Dr. Schrœder asserted that he cultivated potatoes and other things between his vines. If you will give your vines proper cultivation, without raising anything between them, I think you will succeed better than if you grow strawberries, or anything else, between the vines. You will not, I am confident, get the same fruit you would if you cultivate the land without raising these things between the vines.

I presume there are a few persons present who are trying to make vineyards. The great point is to set your vines on land that has been properly prepared. I think that trenching, and filling with bones and compost, is the best way to prepare the land. As to the vines, I think a great deal of the Delaware. It requires rich soil and deep culture. We should, in the main, cultivate those varieties that we know are adapted to the locality in which we raise them.

Mr. Husmann, of Hermann, Mo., was called upon, and responded in substance as follows:

I indorse everything the speaker who last spoke has said. I think the locality has much to do with good results. This manner of dictating what should be planted all over the country, is, to me, simply ignorance. Everyone who has cultivated the grape long, has had his eyes opened, and must be satisfied of the fact that the grape which you can raise in southern localities with complete success, is an entire failure in the North. How men claiming to have experience, can dictate that certain kinds of grapes should be planted in all climates, I cannot understand. My experience thus far has been, that the grape is more particular in regard to climate than any other fruit we have. In our part of the country, some grapes do well that are a failure half a mile from where they are grown. Soil and climate must be carefully studied in raising grapes. I have tried, without success, certain varieties which seem to succeed almost everywhere else.

In regard to pruning and training, perhaps enough has been said; but there is another subject upon which a few words might not be amiss—that is out of door propagation. We have hundreds

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that the wood should not be left to the drying influence of the atmosphere. I never leave my wood out more than two days. Tie the cuttings in bundles—from one to two hundred. Make a trench about a foot deeper than the cuttings are long, and cover them up two or three inches deep. In the spring, as early as I can work the ground, I take my cuttings out, and cut them close below the lowest eye, with a sloping cut. I do not, however, consider it material whether the cut is sloping or not.

[Question—How do you prepare your ground for setting out cuttings?] I have been preparing my ground by subsoil plowing it to the depth of about eighteen inches, and after I have my bed ready, take my spade and open it and put in the cutting so that the uppermost bud is about even with the top of the ground.

[Question—What kind of soil do you like?] I usually prefer very loose friable soil; and if I can get it, the second year from cultivation. The soil we have is a clayey loam.

In the way I speak of, I have grown Norton's Virginia, which is the hardiest and most intractable of all the vines, I believe, to propagate.

[Question—Do you mulch?] I mulch some, and some I do not mulch. I save a larger percentage of those I mulch.

[Question—What do you mulch with?] I have used straw and forest leaves. I think wheat straw is the best mulch for that purpose. I think that by using straw as a mulch during the summer, and covering the ground about an inch, I can make from twenty-five to forty per cent. of Norton's Virginia grow.

[Question—Have you full faith in the method you have described?] I have enough faith in the method to put down one hundred and fifty thousand this season. I think I shall, perhaps, get enough to supply the demand in my section.

[Question—You said, I believe, that you did not mulch all, did you not?] I do not mulch the majority, but I would recommend the mulching, if a man does not put down more than he can mulch conveniently. I think it is a very good assistance in keeping the ground moist.

Mr. Weir—Do you consider cutting the lower end of the scion in the spring, necessary?

Mr. Husmann—I think it is.

Mr. Weir—I have often found them granulated and ready to root in the spring.

Mr. Husmann—I sometimes let them go when I find them in

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A voice—How much do you leave below the eye?

Mr. Husmann—I cut them immediately below the eye; I dont leave quite half an inch.

A voice—What proportion of cuttings usually grow, when treated as you have described?

Mr. Husmann—I usually get from seventy-five to ninety per cent.; but that varies with the kind of grapes. Of the Delaware, I get about twenty per cent. to grow without mulching. I think I can get from fifty to sixty per cent. by mulching.

A voice—Dont you think there is a good deal in the soil?

Mr. Husmann—There is, without doubt. The soil I have found them to succeed in best, was a rich soil, which we could call a good garden soil. My soil is a loam, with clay underneath.

A voice—What kind of a situation do you like?

Mr. Husmann—I prefer hill land; but I think level land will do about as well.

A voice—Do you underdrain?

Mr. Husmann—I do not need to drain. My ground drains itself; it might be necessary in many locations.

A voice—Will mulching do as a permanent method of cultivating the grape?

Mr. Husmann—I have never tried it. We think the best mulching is to keep the ground well stirred; slovenly culture will not do so well as good care.

A voice—How deep do you stir the ground in summer culture?

Mr. Husmann—The first time about six inches, the following times as shallow as I can.

APPLES.

Mr. Minier, from the committee appointed to furnish a list of apples to be recommended for general and extensive cultivation, made the following report; which was adopted:

For Summer—**Early Harvest, Red June, Sweet June, Early Pennock.**
Interim—**Maiden's Blush**
Fall—**Rambo, Snow, Fall Swaar of the West.**
Winter—**Jonathan, Yellow Bellflower, Tallman Sweet, Rawles' Janet, Willow Twig, Winesap.**

EVERGREENS.

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Resolved, That with a firm conviction that such belts or screens will, when well grown, compensate the farmers and the State at large for all cost and expenses of planting and cultivation by returning at least twenty per cent. per annum of such cost in the protection they will afford to crops of grain and fruit, we recommend to the Board of the State Agricultural Society the offering of liberal premiums therefor.

All of which is respectfully submitted.

O. B. GALUSHA,
A. WILLIAMS,
ARTHUR BRYANT, Sr.,
Committee.

Mr. Minier—I wish to have one of those trees stricken from the list—the hemlock. It is too easily killed. When it lives it is a favorite with me, and is worth a dollar and a half a foot for every foot it grows. The hemlock is a slow grower, is expensive and uncertain.

Mr. Kelly—I have had some experience with the hemlock. I hope it will not be stricken from the list. It is certainly one of the most beautiful evergreens we cultivate, whether native or foreign. I have grown them, I think, by the hundred thousand. I have sold them for fifteen dollars per thousand, from six to twelve inches high, and made money on them. It is not necessarily expensive. I think there is no trouble in making the hemlock cheap if properly cared for. I have no doubt but that they will winter well if we get the right kind of trees. It is better to get trees that have been recently transplanted. I would prefer trees that have been transplanted but a year. Within three or four years you can get a hedge three or four feet high.

Mr. Galusha—All evergreens grow slowly. Six inches the first two years is a good growth. I have had no difficulty in the cultivation of this tree. Of the last lot I put out, I did not lose one single tree in a row of perhaps three hundred. After they get started, they will grow from one to two feet per year.

Mr. Bubach—With me the hemlock is doing well. I have had but few fail. I think the rows are about as full as any other evergreen. I have grown it, I think, about as well as the Balsam Fir, and other evergreens.

Mr. Shaw—It is one of the most graceful evergreens, but very hard to get up. The difficulty with which it is transplanted will prevent its extensive culture.

Dr. Hull—I planted some about eighteen years ago, and they are now about twelve feet high.

The hemlock was retained, and the report and resolutions adopted.

GRAPES.

Mr. Weir moved that the Society proceed to the discussion of the grape, and that the Creveling be taken up. Carried.

Mr. Weir—I have not fruited it. I should like to hear from some one who has. I have seen it growing. It is early. I think it is the best black grape I ever tasted. If any gentleman has fruited it in Illinois, I should like to hear from him.

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Mr. Kelsey—It is an early grape; as early as the Hartford Prolific. I saw it at Hartford. The bunch is rather loose. It is a very good grape for family use.

Mr. Murtfeldt—The American people are a very fast people. They always have an object, and as soon as they obtain it they trample it under foot. The people now have grape on the brain; [laughter] the grape will, probably, have a fine short run, and then share the common fate of the other objects of our pursuit. Our last season was very favorable to the growing of the Catawba. I think we had better discuss something we know something about.

Mr. Daniels—I have seen the Creveling fruited where it has been sheltered. The results have been various. When you get a better thing than the Catawba you will have to go a great ways.

Mr. Weir—I was at the United States Pomological Society, meeting at Rochester, and the Creveling was thought much of as a family grape. It is certainly the best black grape I ever ate.

Dr. Hull—I have had the opportunity of tasting the grape. It is a very good tasting grape. It resembles, somewhat, the Catawba, though somewhat darker. I thought very well of it. It was produced from a vine two years old. I was quite well pleased with it. But, as my friend Murtfeldt remarked, if we are going to discuss the grape, we had better discuss those we know something about, and not discuss these new things to the exclusion of those we know something of. I should prefer to pass to some other subject.

Mr. Harmon—I have ripened it and had a very fine variety. It has fine bunches.

Mr. Weir—In Pennsylvania it is considered one of their best growers.

Mr. Husmann—I have seen large numbers of it. My experience is, that it is a slow grower. The fruit I have found to be of a somewhat better quality than the Hartford Prolific. It has rather loose bunches. I think it would not make very large or compact bunches. It might do well for family use.

Mr. Parsons moved that the Creveling be recommended for further trial. Carried.

The Herbemont was proposed for discussion.

Mr. Husmann—It is good, and grows well on the right soil, in the right location. It should have a high and dry location and be well drained, and with plenty of exposure to the sun and air; with these conditions, you can't grow a finer grape. If you bring the Delaware into competition, it will be considered better than the Delaware. It makes good wine, and is an enormous producer. But there is one difficulty with it, it requires a great amount of care, and our people are not apt to take sufficient pains with it. It requires a slight covering. In consequence of neglecting to take proper care of it, it often fails to produce fruit. I can call upon half a dozen gentlemen here, I suppose, who saw the grapes I raised last fall; and if they ever saw anything nicer I should like

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to have them state it. I made some wine from it, and should have had some of it here for you to try, but the rebel general Marmaduke, in his late raid in Missouri, destroyed it. I have known it for fifteen years, and think it is not so particular in soil and location as the Catawba. We think very highly of it; the bunches are large and compact, and often weigh a pound and a half each.

Mr. Eisenmeyer—Four years ago I fixed my ideas, particularly, on the Virginia Seedling, on the Concord and the Herbemont. In planting out, I chose a thousand of the Virginia Seedling, three hundred of the Concord, and three hundred of the Herbemont. Four years ago I considered it equal to the Concord; but the trouble is, that it requires so much care. It wants to be laid down and protected in winter, which is an objection. But where one raises only a few, it is but little work to take care of them. Our vines are planted about five feet apart; we then bend them down, and throw two or three hoes full of dirt on them—enough to hold them down—and then plow them under. They are easily taken up in the spring. The work you do in the soil is a benefit to them, besides protecting them from the winter frosts. Some may ask "How do you get them up in spring?" We go along with something and lift them up; it is better to go along with a fork, or hook, and lift them out of the dirt.

I think the Herbemont is better adapted for Southern Illinois, than for you folks up here, and North of here. I think you have too much winter for them up this way. You may, however, succeed in raising them by covering them; but I think your season is most too short. It is a little late in ripening. I think it is among the latest ripeners—probably it ripens the latest of any. I recommend it, highly, for Southern soil, where the seasons are long enough to mature it.

[Question. Have you tried the mode of protecting it, which you have described, long enough to be satisfied of its utility?]

I have.

[Question. Don't the frost injure the roots?]

The roots are well covered.

[Question. Is there not danger of injuring the roots in plowing?]

There is no danger of plowing close enough to injure the roots. We think it a very excellent way of taking care of them.

Mr. Weir—I think the Herbemont is one of the grapes that will do well in some localities, and on some soils. The Herbemont, in bearing, I consider one of the grandest sights I ever saw. The bunches are magnificent in appearance. I think it can be grown anywhere the Catawba can. I think those who have succeeded with the Catawba would do well to plant the Herbemont. It has a very beautiful foliage.

Mr. Eisenmeyer—I think it has the finest foliage of any of the grapes.

The Herbemont was recommended for further trial.

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COMMITTEE ON WINES.

Dr. Hull moved the appointment of a committee to examine wines, to consist of five. The motion prevailed, and the following named gentlemen were appointed: Hull, of Alton; Andrews, of Rockford; Husmann, of Hermann, Missouri; Fell, of Bloomington; Foster, of Muscatine, Iowa.

COMMITTEE ON FRUITS.

Mr. Flagg moved that a committee of three be appointed to examine the fruits on exhibition; and, also, to examine vines and cuttings. Carried.

The following gentlemen were appointed: Evans, of South Pass; Mann, of Bloomington; Hausen, of Franklin Grove.

Mr. Pearson moved that A. R. Whitney be added to the committee on wines. Carried.

On motion of Mr. Evans, the Society took a recess of half an hour.

AFTERNOON SESSION.

Mr. Flagg stated that on the first day of the session, he brought in a lot of tables, and read a resolution from the American Pomological Society, requesting State Societies to make out tables in the same form.

He moved that a committee of three be appointed from each district in the State, and that they be directed to report to the Executive Committee. The motion prevailed, and the following named gentlemen were appointed:

Southern District—Parker Earl, Dr. E. S. Hull, B. G. Root.

Central District—C. R. Overman, Lloyd Shaw, Jonathan Huggins.

Northern District—Arthur Bryant, Dr. Andrews, A. R. Whitney.

DECIDUOUS TREES.

Mr. Minier, from the committee on deciduous trees, made the following report, which was received and adopted:

The committee appointed to report on deciduous trees, report:

That among the most useful and available trees for clumps and belts, we find to be those most easily propagated from seeds and cuttings.

Among the first, most valuable is the black walnut. Next, we would say the white walnut, or butternut. Third, the wild cherry—with some diffidence. Fourth, the white maple—or silver-leafed maple. Then may be added the red elm, white elm, blue and

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ELECTION OF OFFICERS.

Mr. Minier moved that the society proceed to the election of officers. Carried.

Mr. Shaw moved that the society proceed to an informal ballot for President. Carried.

Messrs. Reynolds, Galusha, Andrews and Baldwin were nominated.

The informal ballot being taken, sixty-five votes were cast, as follows:

Mr. Reynolds received thirty-eight votes, Mr. Andrews fifteen, Mr. Baldwin five, Mr. Galusha four, Mr. Read three.

Upon motion, Mr. Reynolds was declared unanimously elected.

Mr. Reynolds, upon taking the chair, spoke briefly, as follows:

Gentlemen of the State Horticultural Society:—I tender to you my sincere thanks for the honor done me in making me your presiding officer, and pledge you to use all my abilities for the performance of the duties which you have seen fit to impose upon me. It will be my pleasure, always, to do the best I can to assist you in furthering the great interests of Horticulture in our great and growing State. [Applause.]

Mr. Galusha said he could not refrain from rising to move a vote of the thanks of the Society to Father Shepherd, for the interest he had taken in advancing and promoting the science of Horticulture, during the time he had been President of the Society.

Mr. Overman seconded the motion, and it was carried by a unanimous vote.

Vice Presidents—Mr. Galusha was chosen Vice President at large. The following named gentlemen were elected Vice Presidents from the several congressional districts:

Jonathan Periam, first district; C. N. Andrews, second; A. R. Whitney, third; T. McWhorter, fourth; Arthur Bryant, fifth; Elmer Baldwin, sixth; C. L. Pate, seventh; O. M. Coleman, eighth; C. C. Sturtevant, ninth; Charles Snedecker, tenth; Wm. L. Wright, eleventh; Dr. B. F. Long, twelfth; S. B. Jones, thirteenth.

Secretaries—W. C. Flagg was elected Corresponding and Recording Secretary, and John M. Pearson, Assistant Recording Secretary.

Treasurer—Mr. Minkler was chosen Treasurer.

Executive Committee—Messrs. Minier, Reynolds and Shepherd were chosen as an Executive Committee.

Mr. Kennicott moved that the Executive Committee appoint the Publishing Committee. Carried.

GEOLOGICAL ESSAY.

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ON THE FRUIT SOILS OF ILLINOIS.

An Essay read at the last Winter Meeting of the State Horticultural Society, by Dr. H. A. Engelmann.

The writer of the following pages finds his name, very unexpectedly, placed on a committee to report on the fruit soils of our State. Although he would have preferred to leave the task to a more experienced, practical horticulturist, he feels unwilling to disregard repeated solicitations of much valued friends to answer to the call, and, by complying, he wishes to show his appreciation of the eminent services the association is rendering to our noble State, and to every family in the great West. At the same time he must solicit the indulgence of the members, and hopes they will judge leniently of an article which had to be compiled hastily, from disconnected notes, on the spur of the last moment.

The subject is to be "The fruit soils of Illinois." It involves two distinct inquiries: first, into the quality of the soils in the different parts of the State, their physical and chemical composition and properties; and, second, into the adaptability of these different soils to the growth of the different fruits. This discussion embraces all the soils in the State, because it would be preposterous to claim one soil as a fruit soil, and another as no fruit soil. One soil may be good for peach trees, another for grapes, a third for strawberries, a fourth for cranberries, and so on; and who would say that they were not each of them a fruit soil.

In the second part of the discussion we have to take into consideration the difference of the climate in different parts of the State, the greater or lesser altitude of the lands, the absolute, as well as the relative altitude of adjoining lands; further, the difference of exposure, and the varying degree of humidity of the soils at the different seasons. This portion of the discussion I shall leave to the practical horticulturists, and confine myself to the first part of the inquiry, regarding the general quality of the soil, to the recorded knowledge of which I will try to make some few additions.

My observations have been confined nearly altogether to the south-western portion of the State, and it is only of this portion that I will speak. Southern Illinois presents a great variety of soils. We may distinguish principally:

1st. The prairie soils of Southern Illinois.

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part of the State. They are generally of a sandy nature, in a state of exceedingly fine mechanical division, so that they form an impalpably fine powder. They are mostly not loamy, and contain a large admixture of vegetable mould, to which they owe their dark color. These soils are rich, still if it were not for their large amount of humus, the defects of their physical condition would be strongly felt. Siliceous soils of great fineness do not attract moisture, nor, probably, ammonia and other gasses, with the same force as more loamy soils; a heavy rain packs them closely, so that the access of air is entirely shut off from the roots; and the growth of the plants, especially young plants, is considerably checked. The fine particles of the soil are then held together by a strong adhesive power, and it breaks up in hard lumps. Such a condition is certainly unfavorable to the development of plants, the roots of which require a loose soil, in which they can spread freely, and which is accessible to the air. Without air, little growth can take place, and the progressive decomposition of the vegetable and mineral elements of the soil is checked, upon which its fertility depends to a large degree. The long continued humidity of the prairies in the spring, a consequence of their imperfect drainage, increases this defect, and tends to make the soil cold; while, where the humidity is greatest, and lasts the longest in the spring, it proves a serious obstacle to the healthy growth of deep rooting plants, especially of fruit trees with deep tap roots. It is mainly due to the great amount of humus in the prairie soils, that most of these obstacles are overcome, and that they yield such rich crops. The humus has a strong attractive power for moisture and nutritive gasses. It keeps the soil light, warm and moist, and thus favors the continued decomposition of its elements. Some of the prairie soils seem to contain a considerable amount of lime, which helps, also, to make the soil lighter.

The value of the prairie soils for horticulture, is largely determined by their respective depth, and the nature of the subsoils. Where the soil is deep, and the subsoil somewhat loamy, or, still better, contains much coarse sand, the crops are marvellously large. Thus it is, for example, in that district which is underlaid with the limestone and shales next above the coal bed which extends by DuQuoin, Pinkneyville, Sparta, Belleville, etc. The soils on these prairies rival in richness those of Northern Illinois.

Over extensive districts in Southern Illinois, the prairie soil is underlaid, at a small depth, with a so-called hardpan. At some points this is merely a hard and not a thick layer of clay, which

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At other points, especially on both sides of the Ohio and Mississippi railroad, for a considerable distance in Clinton and Marion counties, and farther on, we observe a different kind of hard pan—a white, finely arenaceous subsoil, with numerous brown grains of ferruginous matter, which in the wet season shows very little cohesion, but in the dry season becomes exceedingly hard and compact. It is generally several feet thick, and forms a most abominable subsoil. Where it comes close to the surface nothing will grow, and it then forms the so called scalds, while, where it lies several feet deep, its presence is often hardly felt. You need not expect to see the roots of a fruit tree penetrate this subsoil. Disease and early death will invariably be the consequence of being planted in such a position, except where a tree can live on the upper soil. At some points, I observed numerous nodules of calcareous marl in this subsoil, but generally it is characterized by an abundance of grains of brown and black ferruginous matter which at once indicates the defect of the soil, namely, that it is exceedingly close in consequence of the extreme fineness of its particles, and badly drained. In warm and light soils this iron would be diffused through the soil and give it a yellow color. It avails little to break up this subsoil. Unless it be continually stirred, and its properties changed by cultivation, it will soon again be as close as it was before it was broken.

The character of our prairies is undergoing a gradual but very perceptible change in the progress of their cultivation. Their natural drainage is generally very imperfect, even in the high prairies, and formerly it was still more obstructed by the dense growth of the tall prairie grasses which year after year grew and died on the same spot, and covered the soil with their decaying remains. Besides impeding the rapid surface drainage, and thus causing the soil to absorb more of the falling rain, it attracted the night dews, and shielded the soil from the dessicating and warming rays of the sun. In consequence thereof, our prairies appear to have been formerly, without exception, wet. This has considerably changed, and continues changing under our eyes. The surface drainage is facilitated, especially on the high and rolling prairies, the tall

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prairies which generally occupy the broad ridges between the water courses, are mostly surrounded by timbered flats which extend level with the edges of the prairies, between them and the more broken land towards the creeks. Some flats occupy the wider ridges without a central prairie, especially towards the southern end of the prairie regions, where the timbered area increases. Where these flats are most characteristically developed, they are timbered, principally, with large and widely scattered post-oak which are interspersed with black-jack, and have very little other undergrowth. The woods are, therefore, open, and the soil is scantily covered with vegetation. The barrens occupy the slopes and hills between the prairies or flats and the creeks, and have a rolling or broken surface. They were originally, and some are still, covered with a dense growth of tall grasses, without or with only scattering large trees. Many of them are now covered with a dense growth of scrubby young timber, and some have a good growth of black oak, post-oak, etc.

The soil of the post-oak flats bears close resemblance to the last described white subsoil of some of the prairies. It is also of white color, arenaceous, and very finely comminuted, and has the same admixture of small black grains of ferruginous matter. The upper soil is quite shallow, and is distinguished from the subsoil which reaches to the depth of several feet, merely by a slight admixture of vegetable mold, and by the absence of the ferruginous grains. The surface drainage of these flats is very imperfect, but the permanent waterline lies much deeper than in the prairies. In the wet season the soil of the flats is saturated with moisture to its fullest capacity; it is then more like a quicksand than like a wet clay, and on drying forms an exceedingly compact body, which does not admit the air freely. When it is flooded by rains, the finest particles are carried suspended in the water to the shallow depressions, and form there a dense coating so that the water cannot sink in such places, but remains to be gradually dried by evaporation. These flats were therefore generally regarded by our pioneer settlers as the very worst land, and not altogether without cause. By a few years' cultivation they change, however, considerably. What they need most is frequent stirring of their surface, and the increase of their store of vegetable mold, which is pro-

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consequently more open; the ferruginous grains near the surface are dissolved and diffused through the soil, giving it a yellowish color, and more humus is formed. The barrens are dry early in the season when the prairies and flats are still wet. They can therefore be cultivated early, and the drouth of summer, which seems to be quite severe on them, sets in when most vegetation is far enough advanced to withstand its ravages.

The line between the flats and barrens is by no means so sharply drawn as it might appear from the foregoing remarks. We find all gradations of surface configuration, soil and vegetation between the two types. Before long the last of the grass-barrens will be naturally changed into forests, principally of black-oak and post-oak. Near the Illinois Central railroad, this character of vegetation extends to the Big Muddy river, near Carbondale.

III. The Soil of the White and Black Oak Ridges, South of the Prairie District.—This third class of soils begins South of the prairie region, where the lands rise towards the high dividing ridge from West to East through the south part of the State, and continues to its southern base. These soils occupy the south part of Jackson, Williamson, Saline and Gallatin counties, and the principal portion of Union, Johnson, Pope and Hardin counties, and extend farther north near the Mississippi river. The prevailing geological formation in this district is a very heavy body of sandstones, which, further south, contains alternations of limestones and shales. The whole area is roughly broken; the slopes are steep, and mostly rocky; the creeks have narrow valleys and very little bottom-land; the arable soil is almost altogether confined to the ridges, especially in the northern portion of this district.

The soil on these ridges is light brown in color, rather finely sandy, and warm. In its virgin state it is darker near the surface, from an admixture of humus. At a depth of some inches it becomes more loamy, and at a greater depth it is generally underlaid with a yellow arenaceous clay or loam, and then sand and gravel. The surface-drainage of these lands is complete. They can be cultivated early in the spring, and can sustain the severe drouths of the summer months without serious injury, partly because the vegetation has then obtained a vigorous growth, and the roots have

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South of the summit of the ridge, where the limestones and shales partake in the formation of the hills, there are also many sloping hill-sides and much more rolling country, and the land is perhaps a little richer, but the growth is similar, only the yellow poplar is a little more abundant, a tree which loves a calcareous soil. In a not yet published report on the geology of this district, I have used the following language:

"The sandstones, limestones, shales, slates, etc., are so much blended that the soil which is mostly produced by the disintegration of all these different strata, is physically and chemically well proportioned. The sandstones have furnished sufficient sand to make it warm and light, the shales sufficient clay to keep it from being too dry, and to increase its attraction for humidity and ammonia, the limestones sufficient lime to decompose rapidly the organic substances and to set at liberty the alkaline bases, and besides enough phosphates and other salts which are indispensable to the productiveness of a soil. The upper soil and subsoil are mostly similar to each other, only the first one is a little more disintegrated and mixed with humus. Both are finely arenaceous, not as fine as the white post-oak soil farther north, which is rather too finely comminuted, but fine enough to prevent it from being too light and unretentive of moisture, and generally coarse enough to secure lightness, warmth, and natural drainage, which latter is also favored by the surface configuration. The uniformly fine growth of timber, mostly of deep-rooting species, is due to this physical constitution of the soil which is one of the principal elements of fertility. The depth of the productive soil and the openness of its lower portion which is increased by the growth of deep-rooting timber, make this district especially adapted to the growth of fruit trees. The very best location for orchards is, however, on the top of the forementioned dividing ridge. This situation is much less subject to frost than the lower valleys. In the fall, long after the tender plants have been killed by the frost in the lower country, they remain uninjured on this high ridge, and in the spring, also, the late frosts are not to be feared there. If we consider how important an influence a few degrees of temperature, more or less, or a little more sheltered position will frequently exercise on the fruit crops, the importance of this feature will be at once apparent. It is due to the absence of dampness and of its chilling influence on the high ridge, and to the continual free motion of the air. On this ridge we may therefore cultivate the most tender and early varieties of fruit, provided they can be protected from the severe winter frost. The higher temperature which is the result of the southern latitude, also favors early fruit crops. The Illinois Central railroad offers facilities for speedy transportation to the northern market.

"At points remote from the railroad the cultivation of vineyards will ultimately perhaps be most profitable. The grape culture is

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yet in its infancy in this district, but from my remarks in relation to the soil and climate, I can entertain no doubt that it will ultimately prove highly successful. Only a few vineyards have been planted thus far, and the pioneers have to pass through a school of reverses before they succeed. The varieties best adapted to the soil and climate seem not yet to have been introduced; but a series of well directed experiments would probably soon lead to satisfactory results. The Catawba, the species first planted here, is evidently not in its proper place. The soil is apparently not light enough for it, and it is much subject to mildew and rot there."

IV. The Soils on the Tertiary Formation in the Extreme South-end of the State.—The area included under this head is quite small. It lies between the Ohio river, the lower course of Cash and Bay rivers, and the swamps which stretch between the two latter rivers. It embraces most of Pulaski and Massac counties. The soils in this district differ from those farther north, but are so extremely variable that the limits of this article do not allow me to describe them singly. Most characteristic are the oak barrens or the yellow loam regions. These oak barrens occupy gently sloping, partly rolling or broken ridges. Their soil and subsoil are a yellow more or less arenaceous loam which reaches to a considerable depth. They are most characteristically developed where the loam is least arenaceous and in the finest state of comminution. Their natural growth then consists principally of an abundance of small brushy barren oak, [an upland variety of the Spanish oak, which is confined to the southernmost end of the State,] together with hazel, sassafras, grape vines, and sumach, which are more or less interspersed with large bitter-oak, some post-oak, white-oak, black-oak, white hickory, pignut, black gum, and a few other species. Where the soil becomes more sandy the white-oak grows more numerous and larger, and then a growth of hickories and walnuts preponderates over the barren-oak growth. On the more level land, which has not quite as perfect a surface-drainage, the white and black oak grows less, and finally the post-oak prevails, and we then find post-oak flats similar to those farther north.

The soil in this district contains all the elements of fertility and proves quite superior where the surface-configuration causes a perfect drainage, and where the soil itself contains a sufficient quantity of coarser sand to make it light. Where it is less sandy it is

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tlers, with their slovenly modes of cultivation, used to consider all but the very best points as hardly worth their very moderate exertions.

V. The Soils on the Mississippi Bluffs.—The hills which border the valley of the Mississippi river have on their top soils of various origin. In the first place we find on these bluffs a peculiar deposit which has been distinguished as a separate geological formation of a more recent age than the great drift-formation of the north, and has been called bluff-formation, from the extensive development on the bluffs of the Mississippi and Missouri rivers, but which to the geologists appears merely as a peculiar soil. Further, we observe soils which are derived from the mixture of this material with those which formed the soil farther back of the river, and which are consequently of quite variable quality, often loamy.

The bluff formation which covers the hills quite independent of the different geological formations which form their rocky body, exhibits a remarkable uniformity of character at the most distant points. It generally consists of a fine silt of yellowish buff color, which is too siliceous to be called a loam, and which effloresces with acids in consequence of a small per centage of carbonates of lime and magnesia. It is lightly cemented through its whole mass so that it presents a certain degree of firmness and may often be seen exposed in high vertical excarpments without hardly a sign of stratification—for example, in the streets and at the edge of the bluffs at Alton, and in the bluffs opposite St. Louis. It looses this firmness after being once broken up, and then forms a very deep soil of in many cases rather too great a mechanical division of its single constituent particles. Portions of this bluff-formation are however decidedly sandy, even coarsely sandy—for example, at the edge of the bluffs above Alton—and the sandy soils of the bluffs near Nauvoo, Warsaw, etc., may perhaps also be derived in part at least from this formation.

The quality of the mixed soils on the bluffs is evidently quite variable. The soil formed by the bluff-formation is invariably deep and mostly well drained. Where it is too finely comminuted, and therefore close, it is highly benefited by frequent stirring and by the addition of the vegetable substances which accumulate in it in the course of protracted cultivation. Especially the more sandy portions are admirably adapted to the growth of fruit trees and grape vines, which may spread their roots in it without hindrance and to a great depth without being checked by impervious strata and by accumulations of cold water in the subsoil. The light and broken character of the bluffs secures besides a perfect surface-drainage, generally also safety from the effects of dampness and of frosts which visit the lower situations. If their soil is perhaps not very rich, this defect is counter-balanced by its great depth and warmth. Shallow rooting plants will, however, be apt

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to suffer on this soil by the drouths of summer and fall, because it exercises no great attraction on the humidity in the air, nor on ammonia and other gasses, unless it be by good husbandry, enriched with more vegetable mold than it generally possesses in its virgin state.

VI. The Soils of the Bottom-lands of the Mississippi River.—In speaking of the Mississippi bottoms I have especially in view the large bottoms at the south end of the State, with which I am more acquainted than with those farther north; but I believe my remarks will apply very nearly to all, except that the bottom timber is somewhat different farther north, in consequence of climatical influences. The timber in the extreme south end of the State begins to assume the southern character.

These bottoms are interspersed with lakes, sloughs, cypress-ponds, and marshy tracts. A large portion of them is wet land, not altogether in consequence of their too low situation, compared with the water level of the river, but partly in consequence of a want of proper drainage. Part of these bottoms, especially those nearest the Mississippi, have a soil composed principally of the river sand, sometimes with thin streaks of finer mud or clay, and with a small admixture of humus near the surface. This soil is light, warm, deep, lets off readily all superfluous water, and still receives continually ample moisture from underneath; it is exceedingly fertile, requires little labor in cultivating it, and is often sufficiently elevated to be planted with almost any variety of fruit. In somewhat lower situations of this kind, every high overflow of the river adds a little sediment and rejuvenates the soil, while it generally does not last long enough to do much harm. The timber on these parts of the bottoms consists principally of cottonwood, white elm, sycamore, oak, &c.

Other bottom-lands farther off the river are designated as sandy ridges, and are entirely above the highest flood-mark. They are also ancient sand bars, and have a soil mixed of river sand and clay or river mud. In consequence of their high situation their vegetation is a different one, and more humus has accumulated on their surface. They are equally or even more productive than the first ones, equally well drained, with a light, warm, strong, and easily cultivated soil. They are covered with a most luxuriant growth of giant trees, principally the upland white oak, the bottom white oak, bur oak, spanish oak, yellow poplar, scaly bark hickory, pignut, ash, beech, silver maple, sugar maple, &c.

The soil in other portions of the bottom lands contains less coarse sand, is more finely comminuted; a kind of arenaceous silt with some clay. These lands are also less elevated, and have apparently been formed by the gradual filling of sloughs by the fine mud suspended in muddy water, with only a moderate current. They are consequently more wet than the others, and not near as

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warm and light. On them we observe principally the yellow poplar, sweet-gum, black-gum, bottom white-oak, ash, silver-maple, &c.

Then we find still other lands in the bottoms with a black, very heavy, tenaceous clay soil, which retains moisture with great force. If it is not deep and underlaid with the coarser sandy soil, which seems to be often the case, it would be vastly improved by deep subsoiling, whereby both soils would be mixed and the whole attain a very desirable composition. These points are probably the beds of former lakes, and their soils the slow accumulation of the finest sediment. They are generally situated rather too low, and are principally timbered with water-oak, bur-oak, spanish-oak, maple, elm, scaly-bark hickory, horse chestnut, locust, box-elder, hornbeam, laurel-oak, sweet-gum, red-bud, pecan and ash. The cypress swamps have a spongy soil, often of a finely arenaceous nature.

In some instances the mere felling of the timber and subsequent ploughing have rendered wet stretches of bottom-land sufficiently dry for ordinary cultivation, so that they yielded rich crops.

These I believe are all the principal qualities of soil which have come under my observation. There are of course endless gradations between them, which it would be too tedious, nay even impossible to enumerate singly. In judging the quality of the virgin soils, the natural growth presents one of the best criterions, but it has to be regarded in connection with the other features of the land. The observation that after clearing the old woods a new growth of timber springs up different from the former one, does not militate against this opinion; because in the course of time, especially with the progress of the cultivation of the country, the quality of the land changes in many respects, and they become consequently adapted to a vegetation which is different from the preceding one. Men of reflection, who have paid attention to such matters, will understand that the present features of our country, apart from the recent cultivation and its immediate effects, cannot be those with which it came originally from the hands of the Creator, nor even those which it bore at the beginning of the present geological era, since which it has not been subject to any great earth revolution. The very humus which enriches our soils, and which is one of the principal elements of our agricultural successes, has only been formed in the course of time from the decaying remains of successive vegetations, of which the first ones must undoubtedly have been very different from those which now cover our broad acres.

REPORTS ON WINES.

Mr. Husmann, from the committee appointed to examine the wines on exhibition, made the following report:

The committee on wines respectfully submit the following report on wines examined by the committee:

Concord, 1864, by Michael Poeschel—Considered an excellent article of its class.

Herbemont, 1863, by F. N.—Considered by the committee as an inferior article, and that better can be produced from that grape by fair treatment.

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Catawba, 1864, by Michael Poeschel—Considered an excellent article.

Clinton, 1864—Not clear enough to give a decided opinion, but considered promising.

Cunningham, by F. N.—Considered by the committee as imperfect, and not a fair sample.

Norton's Virginia and Concord, by Mr. Poeschel—An excellent article, as far as can be determined by the committee, the wine being very new.

Norton's Virginia, by M. Wuthrich—An excellent article; preferred by a majority of the committee to the foregoing.

CANADA THISTLE.

Mr. Edwards, of Lamoille, moved that a committee be appointed to memorialize the Legislature to pass a law with a view to preventing the spread of the Canada Thistle. Carried.

The following gentlemen were appointed as said committee: Samuel Edwards, of LaMoille; G. D. Henderson, of Putnam, and W. C. Flagg, of Alton.

SILK WORMS.

Mr. Shepherd read the following letter and report on Silk Worms:

MR. S. SHEPHERD:—Yours of the 7th has been received, and I reply. In answer to your question I would say that my experience in the raising of the Ailanthus Silk Worm during the past summer, has not been encouraging or satisfactory, and yet my failure may have been owing to causes which hereafter may be avoided. The worms which were hatched this summer were from butterflies, whose developments had been retarded for some months, as is often the case in insect life, and they did not seem to be as vigorous as those which are hatched in the due course of nature. Many of them would not feed, and hundreds of the eggs were not impregnated, owing to the indisposition of the perfect insects to copulate in confinement. This will always be a difficulty in the artificial rearing of large butterflies of this family. The result is, that my whole brood has died out, and, as far as I know, the race is extinct on our Atlantic slope. I have recently heard that some man in California is engaged in the work, but with what success I cannot say.

With all my failures, I am not yet disposed to abandon the enterprise. I commenced it merely as a means of agreeable relaxation; having for years pursued the study of entomology, as my two works published by the Smithsonian Institute, will show. I was directed to it by my friend Dr. Stewardson, of Philadelphia, without any prospect of gain, and was induced to write those articles in the Patent Office Reports, at the urgent solicitation of the Commissioner, Mr. Newton. I read the French works on the subject, and my interest gradually increased; but, I regret to say, that the result has not been satisfactory.

From the extensive operations of the French, and their extraordinary success during the first two or three years, I was led to presume that the education of the worms as they call it, had become a regular institution, and that the poor people in France would soon be clothed in silk, even if it were not so fine. They reared cocoons by the bushel, and even the silk weavers of Lyons offered to purchase all the cocoons that would be brought to them.

A new era in the productive interest of the country was anticipated, and it is said that even the Emperor expressed deep concern on the subject. He had stocked the rivers of France with fish for his people, and now he was a going to furnish them with a cheap and

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These are the views I now entertain, that, although my experience has not been fortunate, yet the affair should not be given up. If successful, it would be an inestimable blessing to the country.

We have secured several native species which produce a capital but coarse silk, which could be made into many articles of value. The two most productive are the *Atticus Cecropia* and the *A Polyphemusa*, which are doubtless known to you. They are the largest of our moths, and produce large cocoons which are easily carded like wool.

As it may be of some interest to you, and I am sure is a stranger to you, I inclose a cocoon of the Ailanthus Silk Worm. I do not know how the French manage to unwind it, but when unwound, the silk is beautiful, soft and glossy, of a pearly white.

I am, etc., JOHN G. MORRIS.

The Society now adjourned until 7 o'clock, P. M.

EVENING SESSION.

AGRICULTURAL COLLEGE.

A lengthy discussion took place upon the establishment and location of the Agricultural College. Messrs. Read, Root, Reynolds, Prof. Edwards, and Minier, took part in the discussion.

The resolutions of last evening in reference to the Agricultural College, were re-affirmed.

The committee on the incorporation of the Society reported favorably; and a committee was appointed to draw up a bill for an act of incorporation to be presented to the Legislature.

Mr. Galusha offered the following resolution, which was adopted:

Resolved, That we solicit the Illinois State Agricultural Society to unite with us in petitioning the Legislature for the passage of an act providing for the annual publication, conjointly, of the Transactions of the State Agricultural Society and State Horticultural Society.

Mr. Galusha moved that a committee of three be appointed to consult with a committee of the Agricultural Society in reference to the foregoing resolution. Carried.

Messrs. Galusha, Roots and Minkler were appointed as said committee.

Mr. Murtfeldt offered the following resolutions, which, after considerable discussion, were adopted:

WHEREAS the range for cattle is becoming very limited, and as the importance of improvement in the breeds of cattle is constantly becoming greater, and material for fencing has become so expensive as in many cases to be a barrier to opening farms—

Resolved, That we request of the Legislature of the State to enact a law requiring every man to take care of his own animals, in such manner as shall prevent them from trespassing upon the lands of others.

Resolved, That a committee be appointed by the President to prepare statistics showing the comparative expense of inclosing crops, and of inclosing stock, and present them to the committee upon Agriculture of Illinois at its next session.

The chairman appointed the following gentlemen as the committee required by the second resolution: C. W. Murtfeldt, B. G. Roots, J. W. Fell, O. B. Galusha, Edward Daniels.

Mr. Daniels moved to adjourn. Lost.

GRAPES.

A motion was made to discuss the Catawba Grape. Lost. Reconsidered and taken up.

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Mr. Daniels—I would prefer to take up the list of grapes in regular order. So far as my observation goes, I think the time has not come in which we are to disregard the Catawba grape. When we get a variety of grape adapted to some particular locality, it is not liable to be supplanted in the course of a generation by anything better. Take the history of the discovery of the new varieties of grapes and you will see that it is not oftener than once in a generation that we find so good a grape as the Catawba is under favorable conditions. Every body is satisfied with the Catawba, and it is grown in extensive quantities. I think we are not prepared to give it up yet; but while it is so well fitted for the northern part of the State, it is not fitted for Southern Illinois. I am more than ever, after ten years' experience, in favor of Catawba grapes.

Mr. Weir—If there is any object in bringing up the Catawba grape for discussion I should like to know it. I think we should discuss the new varieties, and not talk so much about those that are so well known and established. Nobody disputes but that the Catawba is a good grape. I think it the duty of this society to test new fruits and give the people information concerning them, and not leave the people to spend thousands of dollars in experimenting blindly with the new fruits. If there is any thing to be done with the Catawba, I should like to hear what it is from the gentleman who made the motion.

Dr. Hull—As regards the cultivation of the Catawba, I have only to say that to certain localities it is admirably adapted. It is, in the judgment of such men as Mr. Husmann, equal to the best grape grown, in some localities. We are learning from year to year that its limits are being extended. It is growing well at Nauvoo. and as far north as Madison, Wis., and even forty miles north of Madison, showing that this grape is adapted to a great extent of country. These are facts that it is well to have understood. It is a grape which is an established representative as a wine grape. Five years from now I presume grapes will be sold for three or four cents per pound. The question is what are we to do with this enormous prospective supply. I think we should so far as we have the ability bring out the facts in reference to the well established grapes.

Mr. Hammond—The gentleman who had the floor a few minutes ago, seemed to think that it would not be particularly inter-

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borhood. It has rotted pretty badly with those who have cultivated it. I think it is a first rate grape. Some seasons it does not rot. I have only fruited it two seasons. Season before last it did not rot, but this season it did. It rotted worse than Norton's Virginia or the Delaware.

Mr. Galusha moved to take up Allen's Hybrid for discussion. Carried.

Dr. Hull, of Alton—I have not fruited it, but have tasted it, and think it quite a good tasting grape.

Mr. Phœnix—It has been planted in Burlington, Iowa, and at that point is very productive, and of a good quality; but I think it is not adapted to our soil. I think, as far as I have seen the fruit, it is really one of our very best white grapes. It is decidedly early. I think it is worthy of trial. It is a very slow growing grape.

Mr. Weir—I agree with the gentleman, except as to its slow growth. Whilst attending the United States Pomological Society, at Rochester, I got my ideas upon this grape, and I thought perhaps I would hear something of it here. There, it was the third grape on the list. I should like to have the members of this society give it a trial.

Mr. ———, —I have had the pleasure of tasting it. So far as my experience has gone I have been inclined to think it the best white grape in cultivation. I have tasted it grown at Janesville, and also farther up in the State. Thousands of cultivators think highly of it. I was at Cleveland at the Ohio Pomological Society, and there it was considered early and hardy. I should be very loth to see it thrown out of cultivation.

Mr. Weir moved that it be recommended for trial. Carried.

On motion, the Society adjourned.

FOURTH DAY—MORNING SESSION.

The Society met at 9 o'clock, President Reynolds in the chair. Prayer by Mr. Shepherd.

The President announced the following gentlemen as the committee to draft the act of incorporation, contemplated in the report of the committee on incorporation: Flagg, Minier, and Henderson.

He also announced the following named gentlemen as the committee on final resolutions: Galusha, Minier, Root.

Dr. Long moved that the Secretary be instructed to furnish the different Vice Presidents with circulars, that they may open correspondence for the purpose of obtaining statistical information in regard to Horticulture. Carried.

NEW CONSTITUTION.

Mr. Flagg presented a new constitution, which was, after consideration, adopted.

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Mr. Flagg also offered a series of by-laws, which were also adopted.

NEXT MEETING.

Mr. O. J. Stough, of Geneseo, offered to give the society $100, if it would hold its next meeting at Geneseo, in Henry county, in view of which offer, Dr. Hall moved that the next meeting be held at that place.

Considerable discussion occurred upon this motion, and the bid that had been made for the meeting of the society at Geneseo. Some held that the society needed funds, and should go where it received the best encouragement, or the largest bids; others, that it should be held in some accessible locality, and where the great interest of horticulture would be best advanced, without regard to the amounts that might be offered to have it go to some particular locality.

Mr. Flagg moved, as a substitute for Dr. Hull's motion, the place of meeting be left to the Executive committee, which motion was lost.

Mr. Murtfeldt moved that the next meeting be held at Normal. Carried.

PEAR BLIGHT.

Mr. Douglas—I have had many theories on the subject of pear blight, but observation has soon contradicted them all. I have paid a great deal of attention to the subject, and have kept changing my theories, but I am now in doubt. I don't know as much about the matter now, as I thought I did ten years ago.

Dr. Long—If we have a work to do, let us go at it. I think we are making improvement, and believe we will yet find out the cause, and discover the remedy for pear blight. Because gentlemen of distinction have not found out the cause of pear blight, is no reason or proof that we may not find it out. I think that it is a disease of the season, and that trees are more liable to be attacked after a rapid growth, when it is in its tender state. We know, that as a general thing, it commences on the leaves of the tree, killing the leaves and running down upon the stem, and proceeding in that way until it kills the whole tree. If it comes from the rapid growth of the tree, we must do something to retard the growth, so that it shall grow slowly, and become more hardy. About eighteen years ago, I put out several trees. I removed all the natural soil from the places where I set them, and filled up with sand and chips. These trees are all standing, with one exception, and that was killed by a horse gnawing it. All of my trees that are standing where they have had a slow growth, are yet perfect. I have, under the shade of an oak, one of the Bartlett pear, that is now four or five inches through, that never had any cultivation; and I have another of the same kind, that has had very careful cultivation; and the one that has stood in the shade,

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without cultivation, has had twice the value of fruit upon it that the other one has.

Mr. Shepherd—I don't believe that there is anything about this economy of the pear, but that can and will be found out. I think we had better continue our observations and investigations. I believe that the causes of pear blight will yet be found out, although they may now seem to be deeply hidden.

Mr. Douglas—For the last ten years or more, I have given you my opinions in regard to pear blight. I have been trying all the remedies I could think of, or hear of, and I have failed to discover any certain remedy. I do not want to encourage people to think I can find a remedy, when my experience and observations only make the cause and the cure more and more uncertain; nor do I wish to discourage others from making experiments; but I confess that my efforts have been rather discouraging to me, and I would not wish to excite any undue expectations.

Dr. Hull, of Alton—It is well known to every member of this convention, that no one understands the causes of pear blight. I refer to what is usually called fire blight; and it is equally well understood, that the disease, be it what it may, can neither ascend or descend, except through the circulation of the sap. Let us take the Seckel, for example; a tree which, in the vicinity of Alton, under ordinary treatment, completes its growth about the last of May, or early in June. I believe we all agree that the blight does not appear earlier than the period last named, and, were it to attack the Seckel, could not be carried upward or downward, and hence, would at most, leave only small, dry patches of bark. The disease cannot spread otherwise than through the circulation of the sap, and hence, it is, that the late growing sorts are more susceptible to its effects. Let us profit by the example of the Seckel, and force our trees to rest before the blight makes its appearance. This is easily effected, and the process so simple that no one can fail fully to understand it.

The circle should be large or small, according to the habits of the tree. For a late growing sort, the trunk three inches in diameter, let the circle be distant from the trunk, eighteen inches. First cut the circle to the depth of the spade, then open a small trench around the tree, and continue to deepen it until you reach and cut all lateral roots. This will leave a circle three feet in diameter, in which the roots are undisturbed. Fill the trench as soon as you effect your object, and renew the operation once in one, two or three years, or as often as is necessary to force the tree to rest at the earliest period that blight manifests itself, care being taken to enlarge the circle in proportion to the growth of the tree. This operation is applicable to standards, and insures early, regular fruiting, and entire exemption from blight.

The discussion was continued by Messrs. Phœnix, Bryant, Weir,

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Kelsey, Snedecker, Daniels, Dr. Schrœder and others. Many theories were advanced, but no certain remedy was made known.

Dr. Andrews, from the committee on fruit soils of Illinois, reported that there had been some misunderstanding by the committee, and they had prepared no report. The committee was continued to the next meeting.

Dr. Andrews offered the following resolutions, which were referred to the executive committee:

Resolved, That this Society will pay a premium of $10 for the best display, in quality and variety of fruit; $5 for the best display of apples; $5 for the best display of grapes; $5 for the best display of wine; $5 for the best winter boquet; $3 for the second best, and $2 for the third best, presented at our next annual meeting, provided the articles be worthy of commendation.

Resolved, That the Executive Committee be and are hereby requested to provide for having two or more lectures on Horticulture, at our next meeting.

Resolved, That the Executive Committee be also requested to prepare an order of business for the use of this Society at its next meeting.

Mr. Flagg moved that delegates be appointed to attend the meetings of the Horticultural Societies of Missouri, Indiana and Ohio.

Messrs. Long, Flagg, Hull, Schrœder, Daniels, Emery and Stough were appointed as such committees.

THE LATE A. G. HANFORD.

Mr. Minier offered the following preamble and resolutions, and they were unanimously adopted:

WHEREAS, the painful tidings has been brought to this Convention, that our worthy and efficient co-laborer, A. G. Hanford, of Columbus, Ohio, has been called from his earthly labors; therefore,

Resolved, That this Convention of the State Horticultural Society of the State of Illinois feel that the Horticulturists of the Northwest have lost, in Mr. Hanford, a worthy, efficient and earnest helper and friend, and that we tender our sympathies to his friends and family.

Resolved, That our Corresponding Secretary be requested to transmit a copy of these resolutions to his family.

Dr. Hull offered the following resolution, which was adopted:

Resolved, That the subject of ascertaining the isothermal lines, by recorded and original observations, be referred to the Executive Committee, and that they be required to act upon the same in such manner as they may deem best calculated to effect this object.

FINAL RESOLUTIONS.

Mr. Galusha, from the committee on final resolutions, made the following report, which was unanimously adopted by a standing vote:

Resolved, That to the citizens of Normal, Bloomington and vicinity, for their cordial hospitality, and unselfish entertainment of the members of this Society, we tender our unfeigned thanks.

Resolved, That we are greatly indebted to the Principal and Faculty of the Normal University, for the kind manner in which we have been entertained and instructed in the departments of their educational course. We have witnessed with great pleasure and inst

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Resolved, That encouraged by these means, we will go back to our employments reinvigorated and strengthened, resolving in our own hearts, that nothing shall be wanting on the part of the Illinois Horticultural Society to make Illinois the most beautiful of all the stars in the resplendent galaxy of the Union

GRAPES ONCE MORE.

Mr. Forbes moved that the Rebecca grape be taken up for discussion. Carried.

Mr. Holt—I have grown it for about eight years. I planted two small vines about eight years since, and they grew very well. I have had to protect them. Last year I had nearly ten dollars' worth that I sold for forty cents a pound.

Mr. Weir—I have planted it for five or six years, and, like the Catawba, it will do well in some situations. With me, it has been very hard to ripen, and has been inclined to mildew and rot. But when ripe, it is the best grape I ever tasted—native or foreign. I think we had better keep on trying it. If it can be grown, it will be very profitable. It is very apt to root kill.

Mr. Holt—I cultivate it on a bluff, with a northwest exposure.

Mr. Weir—It will not grow on bottom land.

Dr. Schrœder—It is a good keeper. I have two bunches in my cellar now. I think it will keep until February.

The Rebecca was recommended for further trial.

The Iowa, Adirondack and Lenoir were taken up and discussed. Each was recommended as possessing good qualities, but upon the vote being taken, they were none of them recommended for further trial.

The Society then adjourned *sine die.*

FRUITS RECOMMENDED FOR GENERAL CULTIVATION.

APPLES.—Early Harvest, Red June, Sweet June, Early Pennock, Maiden's Blush, Rambo, Snow, Fall Swaar of the West, Jonathan, Yellow Bellflower, Tolman's Sweeting, Rawle's Janet, Willow Twig, Winesap.

PEARS.—Osband's Summer, Bartlet, Belle Lucrative, Flemish Beauty, White Doyenne, Seckel, Louise Bonne de Jersey, Duchesse d'Angouleme, Glout Morceau, Easter Beurre.

CHERRIES.—Early Richmond.

GRAPES.—Hartford Prolific, Delaware, Concord, Clinton, (for wine,) Norton, (for wine.)

CURRANTS.—Red Dutch, White Grape, Victoria.

GOOSEBERRIES.—Houghton's Seedling, American Seedling.

RASPBERRIES.—Doolittle's Black Cap, Purple Cane.

BLACKBERRIES.—New Rochelle.

STRAWBERRIES.—Iowa, Wilson's Albany.

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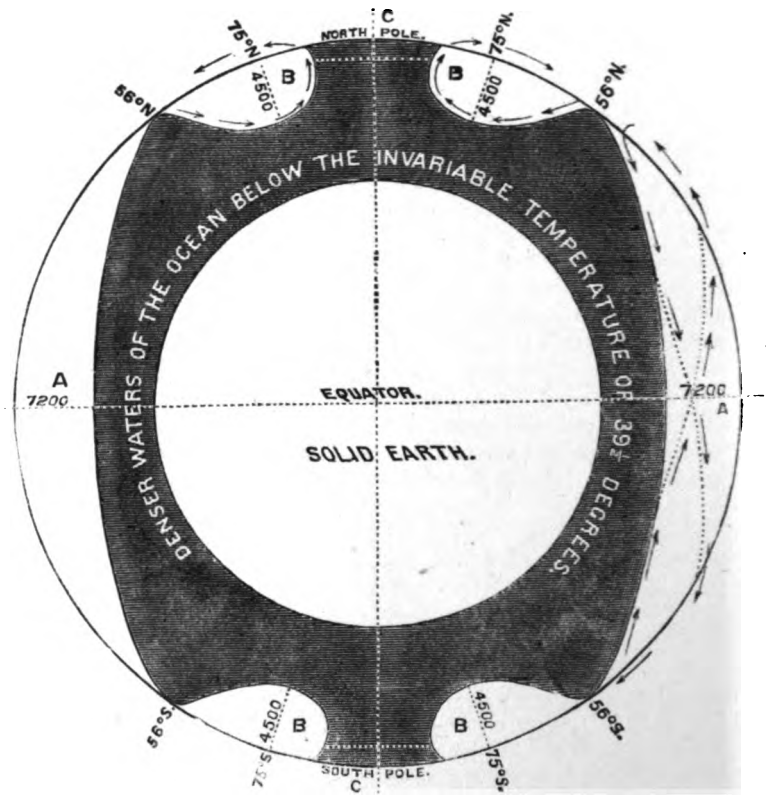

EXPLANATION OF THE DIAGRAM OF THE OCEAN AVALANCHE.

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This diagram will give a general idea of the relative depth, position and motion of the denser and of the lighter waters of the globe, as they would appear if the waters of the earth equally covered the whole surface, without the interruptions of the continents and islands. It supposes the solid globe to be split in two in the middle, through each of the poles, and the interior split surface presented to the spectator, with the depth of the ocean greatly magnified in its proportions.

I. The interior circle represents the solid globe.

II. The exterior ring represents the magnified depth of the waters of the ocean; the shaded par-

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APPENDIX.

THE OCEANIC AVALANCHE AND ITS COUNTER CURRENTS.

A Discourse delivered before the Illinois Natural History Society, at their annual meeting, June 24, 1862,

By J. B. TURNER.

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I have, on a former occasion before this Society, spoken of SPIRIT, FORCE and MATTER, as the ultimate basis, occasion, and cause of all known phenomena, and of their differences, modes and functions.

The great material field, or theatre, through which these principally manifest themselves to us, is in like manner three-fold, namely, EARTH, AIR, and SEA.

I design to call your attention this evening, by request of friends of the Society, to one of the great moving causes of these manifestations, which, it seems to me, our books and our philosophers have most strangely and unaccountably overlooked, even to the present hour.

I refer to what I shall venture to call the GREAT WATER SLIDE OF AVALANCHE OF THE OCEAN, for want of a better name; though I am aware that the term AVALANCHE refers only to the slide of snow or crystalized water on the continental mountain heights. I now use the term to designate the slide of UNCRYSTALIZED water down the great steeps of the "dread unfathomable seas;" a phenomena more simple, terrible and sublime in its causes and effects, than any other, of which I am aware, in the whole created world, unless indeed we except the great law of gravity, which wheels and controls all worlds and spheres, and of which this PERPETUAL AVALANCHE OF THE OCEAN is one of the most striking, majestic, and benign manifestations, that our planet affords: at once by its gran-

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deur over-awing all our philosophies; by its beneficence contributing to all our industries and arts; nurturing the very bones in our bodies as well as the fish of the great deep, and all the cattle and forests upon our thousand hills; still, so simple in all its means and ends, that when we confront it, its very simplicity is even more astounding than its vast reach and grandeur and power.

Of course in a single lecture, even if prolonged through a whole week, I could give you only a most meagre and bare-bone skeleton of this great ever-living, all-controlling POWER OF THE SEAS, and the lands. But I will console myself with the reflection that a "word to the wise is sufficient," and that the few hints which I may here suggest, will be followed up by more thorough and extensive investigations and elucidations, in abler hands.

But where shall I begin to describe the sublime harmony of EARTH, AIR, and SEA, as tuned to an everlasting concord by this great perpetual avalanche of the ocean? I am always confounded when I think of it, and know not where to begin or end, or what from the endless round of its great truths, first or last, to select or present. But I will begin with the simplest ultimate idea—the moving cause of all else—the peculiar action of that mode of force which we call the force of heat, upon water.

It is well known to all, that the specific gravity of pure water is greatest at about the temperature of 39½°, and that unlike most other substances, it becomes lighter at all temperatures above and below this temperature; while the intermixture of all saline or foreign substances somewhat varies this result.

This simple fact produces an irregular spheroidal plane or line of maximum density of the waters over the whole ocean, well known to philosophers and navigators, which culminates in two great belts or zones, or so to speak, mountain heights of the denser waters, piled around the whole globe between 50 and 60° north and south latitude. These encircling zones, or oceanic mountain heights, of these denser waters of the seas in each of the hemispheres, are perpetually sliding down, both towards the poles and equator, into the ocean depths below, by the simple power of gravity, while they are as perpetually replenished by the return currents on the surface, both from the north and the south, from the equator and from the poles. [See Diagram and Notes.]

This simple and sublime arrangement absolutely necessitates the constant agitation, a literal churning, as it were, of the whole ocean,

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The height of this encircling mountain zone of the denser waters at 56° north and south above its lowest known surface at the equator, or under the circle of maximum heat, is 7,200 feet, and 4,500 feet above its bed, at 75°, or near the circle of maximum cold, north latitude, which is about 20°, or 1,200 miles north of its encircling apex or zone. This makes a fall for this mountain zone of these denser waters of about two feet per mile, toward the south or toward the equator, and nearly three feet per mile towards the north, or toward either pole; which is a fall equal to the most rapid mountain torrents, and about five times as great as the average fall of the Mississippi from its source to its mouth, and about 180 times greater then the fall of the Amazon for the last 700 miles of its course. This, in and of itself, independently of the superincumbent lighter strata of water, would produce an oceanic water power, for the restoration of the equilibrium of the globe, equal to the whole water power of more than three hundred thousand Amazons and Mississippis and Niagaras all combined, and all by a simple and almost unnoticeable law of heat operating, like gravity, so quietly that men have as yet scarce suspected its existence. One single reflex current of this mighty force—our own Gulf stream—is estimated equal in volume to a thousand Mississippis. It is self-evident that if this tremendous force was left uncounteracted by the superincumbent strata of lighter and warmer waters on the south, and lighter and colder waters on the north, and also by the equalizing influences of the salter water under the increased evaporation of the equator and of the piles of ice toward the poles, it would long since have torn the solid globe in pieces, and whelmed it in the bottom of the sea.

Few persons, who have not made hydrography a special study, have any idea of the immense force of great masses of water, when meeting in opposing currents, or moving down even the slightest declivity.

The dreaded Pororocca of the Amazon, from which "fishermen and mariners are said to flee in great dismay," and the terrific Bore, of the mouth of the Ganges, are produced by a collision of these streams, at a descent of less than a fourth of an inch per mile, with a mere reflex wave of this great ocean avalanche. What then would be the force of a half million Amazons and Ganges, rushing with the full violence of a mountain torrent, simultaneously down an ocean pile, nearly two hundred times more abrupt, if unimpeded and unchecked by other causes? It is self-evident that, in that case, the loftiest piles of continental mountain granite would have been but mere straws in its path, swept instantly from the face of the earth and buried in the depths of the sea.

But happily, as already stated, these tremendous forces are so counterbalanced by the superincumbent strata of lighter waters, and so nicely readjusted from zone to zone by the combined influences of cold, salt, and ice and heat, that while they still act with irresistible and perpetual force, moving, whirling, churning, and

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agitating the ocean to its lowest depths, and throwing off surface currents and counter-currents, and creating whirlpools and eddies in all directions, greater than ten thousand Mississippis, or a hundred thousand maelstroms, all over the surface of all oceans and all seas, still so nice is the adjustment, that the whole seems to be done as easily and quietly as the mother rocks the infant to sleep in her arms.

But it may be well to consider for a moment some of the more obvious necessary laws and results of this simple and beautiful provision of nature in regard to water, and its philosophical and economic effects as applied in this case to the ocean.

In order to obtain a clearer conception of the whole grand effect, let us for a moment suppose that our earth was wholly covered with water, (as represented in our diagram), without any interruption of continents or islands, leaving the water as free to move around the globe as the upper regions of the atmosphere now are. In that case it is self-evident that all the denser waters SLIDING INWARDS TOWARDS THE EQUATOR, from these two great encircling ocean zones, would take the same direction as the trade winds now do and from the same causes, and would be governed by precisely the same law, except that at those points of meeting, where the lighter and more elastic air produces calms, the denser waters would produce whirls and eddies and counter currents of greater or less power, all over the surface of the seas. Thus these two great equatorial under currents would meet at or near the Equator, as the trade winds now do, and passing each other by an upward slide of the warmer waters over the colder, they would throw forward these return currents on the surface toward the opposite poles, in the same direction that the counter-trade winds pass over us, that is from S. W. to N. E. But the whole mass of equatorial water would receive an impulse toward the west, which would tend to throw it round and round the globe in one unceasing whirl, from east to west, while these resultant side currents and return currents at the surface would form great eddies, in the same relative position as the atmosphere forms its calms of the equator, of cancer, and of capricorn.

It is equally self-evident that each of the two great SLIDES OUTWARDS TOWARD THE POLES would proceed in exactly the opposite directions, and result in producing a vast whirlpool around each pole, with its reflex currents on the surface, flashing eastwards

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Around the south pole and in the broad Pacific, we have this phenomenon almost complete; while the causes which have produced our Gulf stream, and turned the great eddies of the ocean either north or south—as well as those which have produced the upper and lower, the inner and outer currents from our Arctic seas, are so obviously, from the peculiar shape of the continent and of the Island of Greenland, that they need no farther explanation on this assumption than barely a tolerably intelligent inspection of the chart of these currents.

For example, suppose the natural tendency of the waters around the north pole to be identical with what we actually see in those about the south pole, it is self-evident that the peculiar shape of the western coast of Greenland would arrest their eastward motion and turn the surface current outward and southward, along down the shores of the U. S., while the deeper under current of warmer water from the great ocean slide toward the north, would continue to glide on in the depths below, tearing along with it all the great icebergs whose depth was sufficient to reach down to this great ocean-slide; still running against wind and tide, and even plowing, as they do with terrific force, through thick fields of loose ice, and dashing hideously against smaller bergs, which are still borne outward by the shallow southern current upon the surface.

After this northern avalanche, or under current, has thus passed under the fields of ice resting upon the surface, when it meets the opposing under currents that in like manner run into the same Polar sea on the east side of Greenland, and through Behrings Straits, it is forced upward again by this conflict of currents to the surface, at nearly the same temperature which it had when it left the latitude of 56°, and this of necessity produces at the poles A GREAT OPEN SEA, to which the northern sea birds resort for rest and food, and which Dr. Kane's companions saw with their own eyes—for it is well known that water loses but very little of its temperature in gliding, even for thousands of miles, under other bodies of water, or under thick fields of ice. These waters sliding down north from this ocean avalanche, at latitude 56 degrees, are therefore perpetually forced upwards to the surface in one vast whirlpool, at or near the poles of the earth, at about the same temperature as that which they had when they left the crest of this ocean zone at that latitude, and necessarily form a vast open whirling sea at either pole, which crowds all ice-bergs and ice-fields outwards, and fixes the maximum of cold, as well as the maximum of magnetism, where we actually find it, not at the poles, but some 16° south of the poles, in either hemisphere; or where it really ought to be, that is, just half way between the crest of this ocean avalanche, at 56°, where the warmer waters begin to descend, and the poles, where they again ascend at nearly the same temperature to the surface.—[See Diagram.]

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We have thus in the ocean, in general, necessarily four great UNDER CURRENTS perpetually sliding down this great ocean avalanche, or mountain height of the denser waters, from latitude 56 degrees north and south of the Equator; two of them slide toward the Equator, in the direction of the trade-winds, which may be called the EQUATORIAL UNDER-CURRENTS; and two slide the one toward either pole, which run in exactly the opposite course, may be called the POLAR UNDER-CURRENTS.

These, in the depths of the ocean, are the great perpetual moving force, which produces all the counter or return currents at the surface, with all their stupendous whirls and eddies necessarily evolved by these moving under-currents, and modified by the peculiar shape of the continents, and of the bottom of the sea, as would be clearly obvious to the mind of a tolerably intelligent child, who would condescend to dismiss all theories and prejudices, and pretended mystery from his mind, and look intelligently for a half hour to the real facts in the case, as shown upon any good chart of the seas. And although it is amazing to me that even scientific men should have written volume after volume on this subject, without even for once glancing at the real cause, so obvious and so simple, of all these stupendous phenomena of the seas; still they have so clearly described all the outer facts in the case, that I can hardly suppose that there will be an intelligent child in our schools, fifty years hence, who will be ignorant of the true philosophy and cause of these oceanic currents, any more than there is now who is ignorant of the great law of gravitation, of which this is only a most sublime and beautiful part, rather an inevitable result. It is simply the waters of the ocean obeying the great law, which the earth itself, and all the created matter obeys, namely, that law of force, (or forces, if you please), which we call the force of gravity and of heat, as it expands, or moves and contracts, and controls masses or atoms of inert matter. We call it a FORCE, because it produces all FORM and all MOTION in matter; FORM, when equal and from opposite directions; MOTION, in all other cases; it is therefore the proximate cause of all phenomena whatever, and this is all that we do know, and probably all we ever shall know in this world about it.

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to throw its calms or its main eddies inside of 60 degrees, north and south of the Equator; and as the greatest pressure of the atmospheric barometer is at 30°, north and south, indicating that there is the same piling of the weight of the atmosphere at that point, just outside of its eddies or calms, so if we could have an oceanic barometer, it would unquestionably indicate its greatest pressure at about latitude 60°, in the same manner outside of its great surface eddies and calms, making due allowance for the configuration of the continents, and their inevitable effects upon the ocean eddies; and also for the fact that we are all the while examining the BOTTOM of the atmosphere, and the TOP of the ocean, by which fact our law of reason is obviously in many cases, liable to be perpetually reversed, since we live amid and observe only the undercurrents and eddies of the one, and the surface-currents and eddies of the other. At any rate, it is sufficiently evident that if we could get at the bottom of the sea, we should find its general motions made the same as we now find the bottom of the atmosphere; and could we get at the top of the atmosphere, we should find it strangely similar to the top of the ocean, abating the inevitable influence of land and disturbing causes, in each case alike. Each are alike a yielding fluid surrounding the globe, and acted upon by the same force or forces, which we call the force of heat and gravity, modified by other obvious causes, especially by the soluble and solid matters of the globe; and the great law of force by which each is moved and controlled, appears to be identical with that of the other, and only varied by its varying density and other obvious causes; and the well known currents of the air, within these limitations, are precisely identical with the well known currents of the ocean, and proceed in part, if not wholly, from the same cause. Whether the known piling up of the atmosphere just outside of its calms, at about 30°, is the result of a similar cause that piles the denser waters just outside of their great whirls, or whether it results from some law peculiar to the air itself, is a question which physiologists should strive more clearly to solve.

II. What effect the simple action of heat upon the fluids of the ocean and the air has upon the daily rotation of the earth, and whether it is the real cause of that rotation is a question worthy of the investigation of those who have leisure and ability for such researches.

III. Apart from this all-moving force, this ocean avalanche, the vast currents and whirlpools of the surface ocean, the open Polar Seas, the well known poles of cold, 16 degrees south of the real poles, our own Gulf stream, equal to a thousand Mississippis in its volume and power, and various other most striking phenomena, both of the ocean and the land, must forever remain an inexplicable riddle; with it they are all as plain and inevitable as any other effect of the simple laws of gravity and heat, or as the rotation of a

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grindstone upon its axis. We see at once one simple power, not only adequate but indispensable to the whole grand result.

For example, it is said in some of our books, that our Gulf stream actually runs up instead of down an inclined plane; but this enigma, so incredible on any other ground, becomes at once simple and plain when we consi'er that this oceanic avalanche of the colder waters of the north perpetually slides down under this warmer Gulf stream, and necessarily lifts it up, and spreads it outwards, fan-shaped, as it proceeds toward the north; just as an advancing wave would lift up and spread outwards a volume of oil floating in an opposite direction on its surface. That water of its own accord should run up hill is an absurdity; but that an under-current, or any other antagonistic power, would force it up, is plain to all, and the vast power of this perpetual ocean avalance, may perhaps be well realized from this simple consideration: Our Gulf stream, equal in volume as has been said, to a thousand Mississippis, is only one single little ripple of the vast whirls and currents on the surface of the ocean already known to man; but this stupendous, all-moving power in the ocean deeps, plays and dallies with this Gulf stream and all other mighty ocean torrents, when they come in its way, as a lion would with a mouse—for indeed it is in itself the power that at once originates and moves and controls the whole of them. It first shakes them from its shaggy mane and then dandles them in its paws at will.

IV. But I must pass from these general suggestions to notice some of the most striking economic uses of this great avalanche of the Ocean.

And first, it is apparent how needful and appropriate such a general agitation of the waters of the ocean is to the production and safety of its own varied forms of vegetable and animal life. Even a tolerably still ocean of waters, or one only rippled upon its upper surface, with winds and waves and tides, and mere surface streams and eddies, if it did not soon prove a charnel house of putrifaction and death to all in the sea and all on the land, could never subserve the vast ends and uses to all modes and forms of life, by sea and land, which, by this simple arrangement, the present ocean now does.

Its effect in equalizing and modifying the various zones and climates of the world, is too apparent to need even a remark. If, as is the case with most substances, the density of water had increased constantly with decrease of temperature, there could have been no such zones or ridges of denser waters, no great moving power in the depths of the stagnant and putrid ocean. Ice would in that case have sunk to the bottom as it froze, and in all probability our own climate would have been colder than that of South Greenland now is, and all living things would have perished, not only in the seas, but over the greater part of the habitable globe.

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But, by this simple arrangement, there is reason to believe that the earth is made habitable by animal life even to its very poles; and if navigators had pushed their researches along the track of the Gulf stream and in the flow of the warmer waters, to the north of Europe, instead of so incessantly and absurdly battling with the coldest of all currents on the land-locked, ice-bound coast of Greenland, there is good reason to believe that living steamers and living men might have now been sailing directly under the north star, with far less danger and loss of life, than they have encountered in these coldest of all Greenland seas. If a daring and intrepid man, like Dr. Kane, should be sent on this northeastern route, with a proper fleet, he would probably find his way without much difficulty into this ever-open polar sea, and out again at Behring's Straits, should the season favor the enterprise. I am aware that some of the English navigators have run up there and found ice, of course, and run back and told the world that they found ICE, which the world suspected they would find before they went. But I am not aware that a Grinnel, or a Sir John Franklin, or a Dr. Kane, has ever visited those seas with any proper outfit for penetrating to the poles, and till they do, I shall not believe that it cannot be done.

2d. It is evident that the far greater area of open sea, around the South pole, would furnish a volume and power of waters vastly superior to that around the North pole; and that this heavier slide of the cold waters from the south would tend to push the thermal equator, at certain points, north of the geographical equator, as well as to throw vast surface streams, like our Gulf stream, towards the north and northeast, or whirl them in eddies against the shores of northern continents and islands, thus again materially modifying the climates of the globe, as we find it to be in fact.

The excessive surface currents from this greater southern slide toward the north, including our Gulf stream, may return in some unexplored sea, in part, or the northern excess of waters may be wholly consumed in the vast continental absorptions, uses and evaporations, growths and decompositions, which the greater area of land in the northern hemisphere requires in its daily economic uses.

3d. But the most magnificent of all these uses is, perhaps, the manifest provision thus made in the seas for the constant recuperation and repair of all wastes upon the lands, and the consequent continuance and increase of all its varied products of vegetable and animal life.

The immense amount of vegetable material and food for plants that is perpetually, through all the countless streams, and rivers, and sewers of the earth, from all our great cities, and plains, and mountain heights, washed into the sea, has excited the anxious inquiry of all, and the alarm of some, devoted to the interests of

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agriculture and industrial pursuits.* Under this process alone the fertility of the continents tends perpetually toward exhaustion and sterrility, in despite of all human efforts to replenish and repair its incessant wastes; and doubtless such would be the actual result, if the Great Creator had not foreseen the evil, and made ample provision to remedy it, by means so simple, and still so vast and astounding in their reach and power. It is known that something like nine-tenths of the nutriment of all vegetable and animal products are derived from the air alone, or from materials which float in the air, and are absorbed first by the earth and then by the roots of the plants, or else more directly by its leaves. But only a very small portion of this food of plants can be admitted into the air at any one time, without the utter destruction of all animal life. Hence it must be kept in vast depositories, ready for use, and for absorption by the air, all over the globe, by land and by sea, as its exigencies may admit and require. For example: the atmosphere cannot carry at any one time, with safety to animal life. more than about one per cent. of moisture, and one two-thousandth of one per cent. of carbonic acid; both equally indispensable to all vegetable growth, and thus ultimately to all forms of animal life. Now if all the vegetable material thus poured annually into the sea was, as is generally supposed, wasted and lost to the continent, and if the air could derive no part of its indispensable vegetable nutriment from the two-thirds of the earth's surface covered with water, it is self-evident that the whole vegetable economy of the globe would become at once seriously impaired if not ultimately annihilated and extinct.

Our State Agricultural Society have already published my views of those aspects of this avalanche of the ocean, combined with the correlative spiral sweep and oscillation of the air over the continents and around the globe, which relate specially to practical agriculture and horticulture, and therefore touch the practical and daily interests of every born man, whether on sea or land. [See Transactions of Illinois Agricultural Society, Vol. V, 1863.] I will detain you therefore now, only to suggest some one or two of the more philosophical aspects of the manner in which this great power of the seas reaches this most beneficial and practical end.

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pits, specially adapted to the perpetual refirtilization and replenishing of the existing continents from the wastes poured into the sea, and perhaps also designed as the grand apparatus by which new coal-beds and new theatres of life, action and art, shall be prepared in the bottom of the same seas, for future races, on new continents, millions of years hence.

Think of a surface of water larger than the whole Mississippi Valley, covered for most part all over, and in places some feet thick, with floating sea-weeds and debris of vegetation and rubbish, gathered from all lands and shores, sewers and streams, and kept in a perpetual whirl in this great swill-tub of the ocean, till it becomes thoroughly macerated; and then their softer parts are licked up by the air, and carried back to refertilize the wasting lands, while probably, their more solid portions are dropped to the bottom, to form new coal beds for after ages, just like the coal beds now found under our own feet.

It is useless for human language and human lips like mine, to attempt to adequately describe this process, so magnificent, so vast, so simple, so beneficent, and yet so far-reaching and so sublime. But this great Saragosa Sea is only one of the many great oceanic pools which God has set in a perpetual whirl by this simple oceanic power, by which He at once provides nutriment for the lands that now are, and the proper continuance of food for their millions of men, and beasts and birds and insects, with one hand, while He is equally providing for other millions yet to be, with the other hand. But, as I have intimated, these great surface currents are such that whatever floats upon the sea, must either pass at once into these great whirls, (these great liquid manure-vats of the ocean,) or it must be thrown outward upon the shores; and not a single particle of all the myriad tons of vegetable food or other floating matters, that are hourly washed into the sea, can ever be lost.

Suppose that from any of the sewers of our great cities, or our thousand rivers, organic matter passes into the sea, it may pass at once into these vast cess-pools in the centres of the several oceans, or it may be carried round the globe in some of the lateral streams, and dissolve, or be caught and thrown into these whirls at last; or it may be thrown upon the shores, and there perish or sink, and furnish nutriment for the sea-weeds, which themselves in time die and rise to the surface, and go into the same perpetual round, and thus reach these great cess-pools at last, to be licked up by the air and come back to the lands again; or if heavier masses and rafts of timber and logs are borne to the sea, they substantially share the same fate, go the same eternal round, till all their more volatile parts are restored to the vegetation on the lands again, while probably their carbon and heavier parts sink into the bottom of these vast cess-pools, to furnish new coal for races of beings that may never hear that Adam ever lived or that Noah ever was

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born—when these prairies, whereon we now live, may then be, as they have evidently before been, only a vast ocean, under another great whirl of waters, created and controlled by this sublime avalanche of the seas.

Nor is this a mere rhetorical surmise. These great currents are necessarily perpetually disturbing the balance of all the forces of the globe, gathering up immense masses of earth, for instance in the ice bergs from the north, and carting it down south, till already in the valley of the Hudson and the great banks of Newfoundland, as well as in other places, almost a new continent has been formed, aside from all the wonders which the coral insects are performing in the Pacific and other seas; all of which together, must, of course, at last so far disturb the balance of forces in the globe, as to render those catastrophies which make new islands and new lands, and sink old ones, not only natural but inevitable.

Let no man suspect me of technical atheism here. For because I show that God knows how to manage the world, and has ever done it with infinite and adorable skill, even past all our philosophies and past all our comprehension, I do not, therefore, mean to imply that there is no God, no more than when I say that the whole earth is a most perfect machine—I mean to imply that there is no earth, and that all we see is a mere illusion. On the contrary, I only mean to say, that there is a great God, whose plans and purposes and economies, in respect to our earth, are vastly greater, more perfect, more far-reaching, and more sublime, than the boldest philosophic theorist has ever yet dared to express or even to think. But I do not wish to constrain your belief. I only wish to guard my own against a possible, if not natural, misconstruction.

The more profoundly we study the works of God, the deeper is our impression of the simplicity and sublimity of the means employed, the rigorous economy and infinite variety of the results produced. Nothing is lost; not even the grains of wheat or crumbs of bread that are thrown into the sea; nothing is useless, or idle, or misapplied; and even that very ocean, that seems at first the most chaotic, and sluggish and useless of all things, turns out at last to be, like the huge balance wheel of an engine, a most indispensable part, without whose presence and steady action and power, all the rest would be utterly unmanageable and useless.

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if he had no other knowledge of Deity before his mind, than these wonders of the ocean, have heard "every creature in heaven and on earth, and under the earth, and SUCH AS ARE IN THE SEA, and ALL THAT ARE IN THEM saying, Blessing and Honor and Glory and Power BE unto Him that sitteth upon the Throne, and to the Lamb, forever and ever."

This subject naturally suggests the vast RANGE and UNITY and UTILITY of the field of science, some small part of which, we are all aiming and laboring more fully to explore; and the need this Society will have in future years, of ample room for its specimens and deposits, and means for its further investigations.

Every man of tolerably good common sense can see, at once, the immediate connection between our accurate knowledge of those objects of scientific research, in which most of our members have so ardently and so successfully engaged. The Fauna and Flora, the beasts, birds, fish, insects, plants, fossils, soils and minerals of the Great West, are the direct and obvious sources of all our wealth, and lie at the very basis of all our industrial arts. Thousands and ten thousands of plain and honest, though unlearned men, have been made already to see and feel this, and to bless the day when this Society was inaugurated. They regard it, as it truly is, as a child of their own, watched over, nurtured and fostered by their own solicitude and care, as well as devoted to their own uses and ends. Hence the cordial and cheerful aid by all classes of people in the State, that has ever been accorded to it and to the labors of its members in their several fields of research, and the delight with which all have read and learned of their success. How fast our leading members on State Fair occasions, have had to talk to our people, day in and day out, to explain to them what they were so eager to understand and to know.

But who would have expected to find that the colder waters and ice-bergs of the north pole, stand in direct philosophic connection with the plowing of the prairies of Illinois? and yet it is even so; and until a man clearly understands those great laws of heat and force, which whirl the air in its circuits round the globe, pile it in chafing tides beneath the sun and moon, generating storms and calms, and which hurls the ocean from zone to zone and from land to land, in its ceaseless circuits round the globe, he does not understand the moving power that nurtures all art, ministers to all necessity and all life, by sea and land.

Such is the practical unity and utility of all forms of science, when truly prosecuted and applied to their final and legitimate results. The north star teaches us how better to plow the ocean; the north pole how better to plow the land. The air is beginning to whisper its secrets in our ears, and to talk of laws and harmonies and realities, where all was supposed to be but one chaotic and discordant vacuity of all order and all available use.

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The tamed lightning is already our pliant news-boy, the sunbeam our painter, and the re-embodied coal of old worlds performs the drudgery and manipulates the arts of a new one. New science creates new skill and new arts and perfects old ones. Knowledge is power only when applied to its uses, and the practical and useful application of all modes and forms of knowledge is the chief end of all philosophy, and should be the chief aim of its votaries. Thus ideas are wrought into uses, and uses create a thirst for and a capacity for ideas. Instruments and engines of use and of power, of life and of death, multiply and increase on all hands, by land and by sea, as the ages roll away, giving leisure for study and means of wealth and of art, of offense and of defense, till at last the multiform combined forces of FREEDOM and INDUSTRY, PIETY and PRAYER, will make all the enemies of God and man "skedaddle" like wildfire, and the new era of peace shall bless the world. While the moral monsters, the parricides and fratricides and rebels of one age become, like other fossil remains, the petrified instructors and warnings of all ages to come, and as in the natural world the darkness and depths of the sea are made to contribute to the glory of the land, so in the moral world, the darkest deeps of crime shall at last only the more clearly evolve the goodness and the glory of God, and urge still onward the final destiny of man.

Friends, be just and fear not; "let all the ends thou aimest at be thy God's, thy country's and thy truth's."

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FARMERS' CONVENTION AT GRANVILLE,

HELD NOVEMBER 18, 1851.

PROCEEDINGS.

In accordance with previous notice, a convention of farmers was held at Granville, Putnam county, on Tuesday the 18th day of November, 1851. The attendance was quite large, and from various parts of the State.

The convention organized by appointing Hon. Oaks Turner, of Hennepin, Chairman, *pro tem.*, and Mr. M. Osman, of Ottawa, Secretary, *pro tem.*

Mr. Ralph Ware moved that a committee of three be appointed by the chair to nominate permanent officers for the convention, which was agreed to; whereupon the chair appointed Messrs. Ralph Ware, John Hise and Sidney Pulsifer said committee.

The committee, after a few minutes' absence, returned, and reported the following persons as permanent officers of the convention:

Hon. Oaks Turner, President.

Hon. Wm. Reddick, of Ottawa, and Prof. J. B. Turner, of Jacksonville, Vice Presidents.

Mr. M. Osman, Recording Secretary.

Mr. Ralph Ware, of Granville, Corresponding Secretary.

On motion, the report was adopted and the committee discharged.

The President then stated that he was not fully advised as to the real objects of the convention, and suggested that some one better qualified should make them known.

Mr. Ware then stated that, according to the call, they had met to take into consideration such measures as might be deemed most expedient to further the interests of the agricultural community, and particularly to take steps towards the establishment of an Agricultural University.

On motion of Mr. Greble, a committee of three was appointed to report business upon which the convention should act. The committee consisted of Mr. John Greble, Prof. J. B. Turner and Mr. Lewis Weston.

During the absence of this committee short addresses were delivered by Messrs. Hise, Greble, Ware, and others.

The committee returned, and stated that they would not be fully prepared to report before evening, and suggested that the after-

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noon be devoted to a general discussion of such subjects pertaining to agriculture as might present themselves.

A lively discussion was then commenced on various subjects, in which Powell, of Mt. Palatine, Butler, of Spoon River, Greble, of Putnam county, Weston, of LaSalle county, Gilmer, of Granville, Reddick, of Ottawa, and others, participated.

After which, the convention adjourned until half-past six o'clock in the evening.

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EVENING SESSION.

The convention was called to order by the chairman.

Prof. Turner, as chairman of the committee on business, reported the following resolutions for the future action of the convention:

Resolved, That we greatly rejoice in the degree of perfection to which our various institutions, for the education of our brethren engaged in professional, scientific, and literary pursuits, have already attained, and in the mental and moral elevation which those institutions have given them, and their consequent preparation and capacity for the great duties in the spheres of life in which they are engaged; and that we will aid, in all ways consistent, for the still greater perfection of such institutions.

Resolved, That, as the representatives of the industrial classes, including all cultivators of the soil, artisans, mechanics, and merchants, we desire the same privileges and advantages for ourselves, our fellows, and our posterity, in each of our several pursuits and callings, as our professional brethren enjoy in theirs; and we admit that it is our own fault that we do not also enjoy them.

Resolved, That, in our opinion, the institutions originally and primarily designed to meet the wants of the professional classes, as such, cannot, in the nature of things, meet ours, no more than the institutions we desire to establish for ourselves could meet theirs; therefore,

Resolved, That we take immediate measures for the establishment of a University, in the State of Illinois, expressly to meet those felt wants of each and all the industrial classes of our State; that we recommend the foundation of high schools, lyceums, institutes, &c., in each of our counties, on similar principles, so soon as they may find it practicable so to do.

Resolved, That in our opinion, such institutions can never impede, but must greatly promote, the best interests of all those existing institutions.

After reading the above resolutions, Prof. Turner proceeded, in an able and interesting manner, to unfold his plan for the establishment and maintenance of the Industrial University.

The convention then adjourned till 9 o'clock to-morrow morning.

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WEDNESDAY MORNING, NOV. 19.

Met, pursuant to adjournment.

On motion, the resolutions were again taken up and read, and after some deliberation, severally adopted.

Mr. Hise offered the following resolutions:

Resolved, That we approve of the general plan for an Illinois State University for the Industrial Classes, presented by Prof. J. B. TURNER, and request him to furnish the outlines of his plan, presented to this convention, to the committee of publication, for publication in the Prairie Farmer, and all other papers in the State which will publish the same; and that one thousand copies be published in pamphlet form for gratuitous distribution.

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Resolved, That W. A. Pennell, M. Osman, L. L. Bullock, and Ralph Ware, be a committee of publication.

Resolved, That the committee of publication forward to each editor in every county in the State a copy of the publications of this convention, with a request that they should publish the same; and, also, send a copy to our Governor, Senators and Representatives, and State Officers, and to all others who may be interested in the same.

Resolved, That each member of this convention do all in his power to promote the circulation and reading of the above publications, and through this and other means to secure, as far as practicable, speakers to lecture on the subject in each of the counties of the State.

Resolved, That Messrs. J. B. Turner and Marcus Morton, of Morgan county; James McConnell, Elijah Iles, and David L. Gregg, of Sangamon county; John Davis, of Decatur; John Wood, of Quincy; John Hise, of La Salle county; Aaron Shaw, of Lawrence county; John Dougherty, of Union county; L. S. Pennington, of Whiteside county; W. J. Phelps, of Elm Wood, Peoria county; and Dr. Ames, of Winnebago county, be a central committee, to call a State Convention, to meet at Springfield at an early hour of the next session of the Legislature, or at such other time and place as they and the friends of the cause may deem most expedient.

Resolved, That this Convention earnestly solicit the Governor of this State to enumerate in the call for an extra session of the Legislature, should one be held before the next regular session, the objects of this convention in the establishment of an Industrial University, as business to be acted upon by that body at that time.

Resolved, That a memorial and petitions be prepared and furnished by the publishing committee for the purpose of petitioning the Legislature on this subject.

During the discussion of these resolutions the Convention adjourned till 1 o'clock P. M.

AFTERNOON SESSION.

Met, pursuant to adjournment.

Mr. Hise's resolutions were again taken up and severally passed.

Mr. Lofflin introduced the following resolution, which was adopted:

Resolved, That we earnestly solicit the people of this State to meet in their primary assemblies and discuss the objects of this convention, as shall be made known by our published proceedings, and join with us in asking the Legislature to grant to the people of this State the fund which belongs to them, to aid them in establishing an institute for the industrial classes of this State, instead of dividing that fund among the different colleges now in the State, as contemplated by those institutions.

In compliance with a request made by Mr. Thomas Ware, and others, Prof. Turner gave a short history of a number of experiments he had made in reference to the blight upon fruit trees.

The Convention then adjourned *sine die*.

OAKS TURNER, *Pres't.*

M. OSMAN, *Sec'y.*

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SECOND CONVENTION.

The Second Convention was held at Springfield, June 8, 1852. A controversy there arose between the members of the Industrial Convention and the advocates and representatives of some few of the old classical and theological colleges, who were admitted by courtesy to participate in the debates of the convention, which consumed most of the time of the convention, and but little, if any, impression for good was made upon the public mind.

These colleges desired to be made, themselves, the instruments through which the funds of the State should be applied to the education of the industrial classes. This the representatives of these classes have at all times, in all their conventions, unanimously and steadfastly opposed.

At a meeting, however, the following memorial was presented to the Legislature:

To the Senate and House of Representatives of the State of Illinois.

The Convention of the friends of the Industrial University proposed to the consideration of the people of Illinois, by the Granville Convention, whose report is alluded to in the Message of the Governor of the State, beg leave to submit to the consideration of the Senators and Representatives of the people the following memorial:

But three general modes have been publicly proposed for the use of the College and Seminary funds of the State.

I. The *perpetual continuance* of their use for common school purposes, is not seriously expected by any one, but only as a temporary use as a loan for this noble object.

II. The equal distribution of their proceeds among the ten or twelve colleges in charge of the various religious denominations of the State, either now in existence or soon to arise to claim their share in these funds, and the equally just claim of Medical and other Institutions for their share, it is thought by your memorialists, would produce too great a division to render these funds of much practical value either to these Institutions or to the people of the State. Nor do they consider that it would make any practical difference in this regard whether the funds were paid directly by the State over to the Trustees of these Institutions or disbursed indirectly through a new Board of Overseers or Regents, to be called the University of Illinois. The plan of attempting to elect by State authority some smaller number of these Institutions to enjoy the benefit of the funds, on the one hand, to the exclusion of others, or attempting to endow them all, so as to fit them for the great practical uses of the industrial classes of the State, we trust your honorable bodies will see at once to be still more impracticable and absurd, if not radically unequal and unjust, in a free State like ours.

III. Your memorialists therefore desire not the dispersion by any mode, either direct or indirect, of these funds, but their continued preservation and concentration for the equal use of all classes of our citizens, and especially to meet the pressing necessities of the great industrial classes and interests of the State, in accordance with the principles suggested in the message of his Excellency, the Governor of the State, to your honorable bodies; and also in the recent message of Governor Hunt, of New York, to the Legislature of that State, and sanctioned by the approval of many of the wisest and most patriotic statesmen in this and other States.

The report of the Granville Convention of farmers, herewith submitted and alluded to, as above noticed in the message of our Chief Magistrate, may be considered as *one*, and as *only* one, of the various modes in which this desirable end may be reached, and is alluded to in this connection as being the only pub-

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lished document of any convention on this subject, and as a general illustration of what your petitioners would desire when the wisdom of the Senators and Representatives of the people shall have duly modified and perfected the general plan proposed, so as to fit it to the present resources and necessities of the State.

We desire that some beginning should be made, as soon as our statesmen may deem prudent so to do, to realize the high and noble ends for the people of the State proposed in each and *all* of the documents above alluded to; and if possible, on a sufficiently extensive scale to honorably justify a successful appeal to Congress, in conjunction with eminent citizens and statesmen in other States, who have expressed their readiness to co-operate with us for an appropriation of public lands for each State in the Union for the appropriate endowment of Universities for the liberal education of the industrial classes in their several pursuits in each State in the Union.

And in this rich, and at least prospectively, powerful State, acting in co-operation with the vast energies and resources of this mighty confederation of united republics, even very small beginnings, properly directed, may, at no very remote day, result in consequences more wonderful and beneficent than the most daring mind would now venture to predict, or even conceive.

In the appropriation of those funds your memorialists would especially desire that a department for normal school teaching, to thoroughly qualify teachers for county and district schools, and an appropriate provision for the practical education of the destitute orphans of the State should not be forgotten.

We think that the object at which we aim must so readily commend itself to the good sense and patriotism, both of our people, rulers, and statesmen, when once fully clearly understood, that we refrain from all argument in its favor.

We ask only that *one* institution for the numerous industrial classes, the teachers and orphans of this State, and of each State, should be endowed on the same general principles, and to the same relative extent, as some *one* of the numerous institutions now existing in each State for the more especial benefit of the comparatively very limited classes in the three learned professions. If this is deemed immoderate, or even impracticable, we will thankfully accept even less.

As to the objection that States cannot properly manage literary institutions, all history shows that the States in this country, and in Europe, which have attempted to manage them by proper methods, constituting a vast majority of the whole, have fully succeeded in their aim; while the few around us which have attempted to endow and organize them on *wrong* principles, condemned by all experience, have of course failed. Nor can a State charter and originate railroads, or manage any other interest, except by proper methods and through proper agents. And a people or a State that cannot learn in time to manage properly and efficiently all these interests, and especially the great interests of self-education, is obviously unfit for self-government, which we are not willing as yet to admit in reference to any State in the Union, and least of all our own.

With these sentiments deeply impressed upon our hearts, and on the hearts of many of our more enlighted fellow-citizens your memorialists will never cease to pray your honorable bodies for that effective aid which you alone can grant.

Respectfully submitted,

By order of the Committee of the Convention.

J. B. TURNER,
Chairman.

THE THIRD CONVENTION

Was held at Chicago, November 14, 1852.

At this convention much important business was transacted, and many interesting views suggested and speeches thereon made and reported.

Among other things, it was resolved to organize "THE INDUSTRIAL LEAGUE OF THE STATE OF ILLINOIS," which has since

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been chartered by our Legislature, empowered to raise a fund, by subscriptions from the members, of ten cents each per annum, and by voluntary contributions, to be applied to the forwarding of the objects of the convention, and promoting the interests of the industrial classes,

1st. "By disseminating imformation, both written and printed, on this subject."

2d. "By keeping up a concert of action among the friends of the industrial classes."

3d. "By the employment of lecturers, to address citizens in all parts of the State." "Prof. J. B. Turner, of Jacksonville, was appointed Principal Director."

"John Gage, of Lake county, Bronson Murray, of La Salle county, Dr. L. S. Pennington, of Whiteside county, J. T. Little, of Fulton county, and Wm. A. Pennell, of Putnam county, Associate Directors."

It was also "resolved, that this Convention memorialize Congress for the purpose of obtaining a grant of public lands to establish and endow Industrial Institutions in each and every State in the Union."

"The plan for an industrial University, submitted by Prof. Turner to the Granville Convention, was then called for, and a motion passed to discuss its principles by sections; whereupon, after thus reading and discussing its various sections, the general principles of the plan were approved."

It was also "voted unanimously, that a department for the education of common-school teachers be considered an essential feature of the plan."

"Prof. J. B. Turner, of Jacksonville, Wm. Gooding, of Lockport, and Dr. John A. Kennicott, of Northfield, were appointed a committee to report a plan to the next convention, and to memorialize the Legislature for the application of the college and seminary funds to this object, in accordance with the acts and ordinances of Congress," &c.

"J. B. Turner, L. S. Bullock, and Ira L. Peck, were also appointed a committee to prepare an address to the citizens of this State, on the subject of Industrial Education, and the establishment of an industrial Institution."

THE FOURTH CONVENTION

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members and delegates, and the representative and executive officers of the people, in the Legislature, many of whom, from all parts of the State, took the deepest interest in the subject, and made noble and eloquent speeches at their evening session in the Senate chamber in its behalf. It was

Resolved, That inasmuch as any detailed plan of public instruction can only be decided and acted upon by the Trustees, Directors, or other officers of the desired Institution, when created, it is not expedient to attempt to fix upon any such details in any preliminary conventions of the people; and that the committee appointed to report upon that subject be discharged from further duty.

The duties and terms of office of the League were also prescribed by this Convention.

After the adjournment of the Convention, the following memorial was written, at the request of the committee, and signed by the President of the Convention, and presented to the Legislature, in accordance with a resolution passed by the Convention:

To the Honorable Senate and House of Representatives of the State of Illinois:

We would respectfully represent: That we are members of the industrial classes of this State, actively and personally engaged in agricultural and mechanical pursuits. We are daily made to feel our own practical ignorance, and the misapplication of toil and labor, and the enormous waste of products, means, materials and resources, that result from it. We are aware that all this evil to ourselves and our country, results from a want of knowledge of those principles and laws of nature that underlie our various professions, and of the proper means of a practical application of existing knowledge to those pursuits. We rejoice to know that our brethren in the several learned professions have, to a good degree, availed themselves of these advantages, and have for years enjoyed their benefit. They have universities and colleges, with apparatus; libraries, voluminous and vast; able and learned professors and teachers, constantly discovering new facts, and applying all known principles and truths directly to the practical uses of their several professions and pursuits. This is as it should be. But we have neither universities, colleges, books, libraries, apparatus, nor teachers, adapted or designed to concentrate and apply even all existing knowledge to our pursuits, much less have we the means of efficiently exploring and examining the vast practical unknown that lies all around us, spreading darkness and ruin upon our best laid plans, blighting our hopes, diminishing our resources, and working inevitable evil and loss to ourselves, to our families, and to our country. Some think one-half (no intelligent man thinks that less than one-third or one-fourth) of the entire labor and products of our State are made an annual sacrifice to this needless ignorance and waste. Knowledge alone, here, is power, and our relief is as clearly obvious as our wants. We need the same thorough and practical application of knowledge to pursuits that the learned professions enjoy in theirs, through their universities and literature, schools and libraries that have grown out of them. For even though knowledge may exist, it is perfectly powerless until properly applied, and we have not the means of applying it. What sort of generals and soldiers would all our national science (and art) make, if we had no military academies to take that knowledge and apply it directly and specifically to military life?

Are our classic universities, our law, medicine, and divinity schools, adapted to make good generals and warriors? Just as well as they are to make farmers and mechanics, and no better. Is the defence, then, of our resources of more actual consequence than their production? Why then should the State care for the one and neglect the other?

According to recent publication, only one in 260 of the population of our own State are engaged in professional life, and not one in 200 in the Union generally. A great proportion even of these never enjoyed the advantages of our classical and professional schools. But there are in the United States 225 principal universities, colleges, and seminaries, schools, &c., devoted to the interest of the professional classes, besides many smaller ones, while there is not a single one, with liberal endowments, designed for the liberal and practical education of the industrial classes. No West

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Point as yet beams upon the horizon of their hope; true, as yet, our boundless national resources keep us, like the children of Japhet emigrating from the Ark, from the miserable degradation and want of older empires; but the resources themselves lie all undeveloped in some directions, wasted and misapplied in others, and rapidly vanishing away as centuries roll onward, under the ignorance or unskillfulness that directs them. We, the members of the industrial classes, are still compelled to work empyrically and blindly, without needful books, schools, or means, by the slow process of that individual experience that lives and dies with the man. Our professional brethren, through their universities, schools, teachers, and libraries, combine and concentrate the practical experience of ages in each man's life. We need the same.

In monarchical Europe, through their polytechnic and agricultural schools, some successful effort has been made, in some departments and classes, to meet this great want of the age.

But in our democratic country, though entirely industrial and practical in all its aims and ends, no such effort has been efficiently made. We have in our own State no such institutions, and no practical combination of resources and means, that can ever produce one worthy of the end. We have not even a "Normal School" for the education of our teachers, nor half a supply of efficient teachers even for our common schools; and never can have without more attention to the indispensable means for their production. Hence, our common schools are, and must continue to be, to a great extent, inefficient and languishing, if not absolute nuisances on our soil, as in some cases they now are. But the common school interest is the great hope of our country, and we only desire to render it efficient and useful, in the only way it can be done, by rearing up for it competent and efficient teachers in the normal department of our industrial universities. Knowing that knowledge, like light and water, runs downward, not upward, through human society, we would begin with the suns and the fountains and not with the candles and puddles, and pour the light and water of life, down through every avenue of darkness below, and not begin with the darkness and drouth, and attempt to evolve and force it upward. No State ever did, or ever will, succeed by this latter process. The teacher is the first man sought, and the life and light of the whole thing, from the university downward.

To this end, concentration is the first indispensable step. Leaving all our common school funds untouched, as they now are, the proposed distribution of our university fund, amounting to about $150,000, will illustrate this point. The annual interest of this, at 6 per cent., is about $9,000. If this should be divided among our ten or fifteen colleges, it would give them only from $600 to $900 each per annum. Divided among our hundred counties, it would give $90 to each county, for a high school or any other purpose. Divided, as it now is, among the million of our people, it gives nine mills, or less than one cent, to each person. Concentrated upon an Industrial University, it would furnish an annual corps of skillful teachers and lecturers, through its normal school, to go through all our towns and counties, create, establish, and instruct lyceums, high schools, and common schools, of all sorts, and through its agricultural and mechanical departments, concentrating and diffusing the benefits of practical knowledge and experience over all our employments and pursuits, our farms and shops. Here, as elsewhere, the sun must exist before the diamonds and dew-drops can shine. The mountain heights must send down their rills and their torrents, gathered from their own flood and the boundless resources of the ocean and the sky, before the desert can blossom as the rose. Money, however much or little, concentrated in logs, clapboards, and brick, enclosing a herd of listless, uneasy, and mischievous children, cannot make a common school. The living teacher must be there—living not dead; for dead teachers only make dead scholars the more dead. Nor can grammar, language, metaphysics, or abstract science, however accurate, voluminous, and vast, ever diffuse new life and new energy into our industrial pursuits. There, practical apparatus, the thorough and accurate needful experiments, as well the living and practical teachers, are needed in order even to begin the great work. This is necessarily expensive, quite beyond even the anticipated resources of our existing institutions. Hence, again, we need concentration, and not a miserable, useless, and utterly wasteful diffusion of our resources and means.

Throughout our State and throughout the whole civilized world, in all ages, where there has been most neglect of universities and high seminaries, and most reliance placed by the people in the miserable pittance doled out to them by the State, like so many paupers, for the support of common schools, precisely there the common schools

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will be found, for the inevitable reasons above indicated, most inefficient, weak, and worthless, if not positive nuisances to society; and wherever the reverse is found, the reverse influences of life, light, animation, and hope, beam forth from the schools at once.

We repeat it, the common school is our great end, our last hope, and final joy. But we would reach and re-animate it under the guidance of practical common sense, as all experience shows it must be done, as it only can be done, and we would reach the vital, practical interests of our industrial pursuits, by precisely the same means, and on precisely the same well-known and thoroughly tried plans and principles. We seek no novelties. We desire no new principles. We only wish to apply, to the great interest of the common school and the industrial classes, precisely the same principles of mental discipline and thorough scientific and practical instructions, in all their pursuits and interests, which are now applied to the professional and military classes.

The effect this must have in disciplining, elevating, and refining the minds and morals of our people, increasing their wealth and their power at home, and their respect abroad, developing not only the resources of their minds, but their soil and treasures of mineral, and perfecting all their materials, products, and arts, cannot but be seen by every intelligent mind.

No other enterprise so richly deserves, and so urgently demands, the united effort of our national strength.

We would, therefore, respectfully petition the honorable Senate and House of Representatives of the State of Illinois, that they present a united memorial to the Congress now assembled at Washington, to appropriate to each State in the Union an amount of public lands, not less in value than five hundred thousand dollars, for the liberal endowment of a system of Industrial Universities, one in each State in the Union, to co-operate with each other, and with the Smithsonian Institute at Washington, for the more liberal and practical education of our industrial classes and their teachers, in their various pursuits, for the production of knowledge and literature needful in those pursuits, and developing, to the fullest and most perfect extent, the resources of our soil and our arts, the virtue and intelligence of our people, and the true glory of our common country.

We would further petition that the executive and legislature of our sister States be invited to co-operate with us in this enterprise, and that a copy of the memorial of this legislature be forwarded by the Governor to the Governors and Senates of the several States.

We would also petition that the University fund of this State, if not at once applied to these practical uses, be allowed to remain where it now is, and its interest applied to present uses, until such time as the people shall be prepared to direct it to some more efficient use.

By order of the Convention. BRONSON MURRAY, *President.*

A similar memorial was submitted to the Convention by the committee, consisting of his Excellency Gov. French, Hon. David L. Gregg, and Dr. L. S. Pennington, appointed by the Chicago Convention, and accepted and fowarded to Congress, as ordered by that Convention.

These memorials were presented to the Senate and Representatives of Illinois, then in session, and the merits of the plan fully discussed by able and eloquent advocates, and the following resolutions were unanimously passsed by both houses and received the approbation of the executive.

WHEREAS, The spirit and progress of this age and country demand the culture of the highest order of intellectual attainment in theoretic and industrial science: *And whereas*, it is impossible that our commerce and prosperity will continue to increase without calling into requisition all the elements of internal thrift arising from the labors of the farmer, the mechanic, and the manufacturer, by every fostering effort within the reach of the government: *And whereas*, a system of Industrial Universities, liberally endowed in each State of the Union, co-operative with each other and the Smithsonian Institution at Washington, would develop a more liberal and practi-

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cal education among the people, tend the more to intellectualize the rising generation, and eminently conduce to the virtue, intelligence, and true glory of our common country; therfore, be it

Resolved by the House of Representatives, the Senate concurring herein, That our Senators in Congress be instructed and our Representatives be requested, to use their best exertions to procure the passage of a law of Congress donating to each State in the Union an amount of public lands not less in value than *five hundred thousand dollars*, for the liberal endowment of a system of Industrial Universities, one in each State in the Union, to co-operate with each other, and with the Smithsonian Institution at Washington, for the more liberal and practical education of our industrial classes and their teachers; a liberal and varied education adapted to the manifold wants of a practical and enterprising people, and a provision for such educational facilities, being in manifest concurrence with the intimations of the popular will, it urgently demands the united efforts of our national strength.

Resolved, That the Governor is hereby authorized to forward a copy of the foregoing resolutions to our Senators and Representatives in Congress, and to the Executive and Legislature of each of our sister States, inviting them to co-operate with us in this meritorious enterprise.

We give the following as a sample of the sentiments of the press, at home and abroad, upon the above resolutions, at that time:

"EDUCATION FOR THE PEOPLE."—The New York *Tribune* of Feb. 26th, has the following remarks, subjoined to the joint resolutions passed by our General Assembly, relative to the establishment of Industrial Universities, and for the encouragement of practical and general education among the people:

"Here is the principle contended for by the friends of practical education abundantly confirmed, with a plan for its immediate realization. And it is worthy of note, that one of the most extensive of public land (or new) States proposes a magnificent donation of public lands to each of the States, in furtherance of this idea. Whether that precise form of aid to the project is most judicious and likely to be effective, we will not here consider. Suffice it that the Legislature of Illinois has taken a noble step forward, in a most liberal and patriotic spirit, for which its members will be heartily thanked by thousands throughout the Union. We feel that this step has materially hastened the coming of scientific and practical education for all who desire and are willing to work for it. It cannot come too soon."—*Ill. Journal.*

The *Central Illinois Times*, a newspaper published at Bloomington, gives utterance to the following, affixed to the resolutions respecting the establishment of Industrial Universities:

"The above is undoubtedly of more interest and importance to the peopl of this State, than any measure which came before the Legislature during the late session. It contains a wholesome principle of prosperity and advancement, which will, if fully carried out, tend to elevate and improve the condition of the honest, hard-working farmer. We have always held that the first object of government is to afford pro-

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DESIGN OF THE INDUSTRIAL LEAGUE OF ILLINOIS.

OFFICERS.

Principal Director.—J. B. TURNER, Jacksonvile.

Associate Directors.—JOHN GAGE, Lake county; L. S. PENNINGTON, Whiteside county; BRONSON MURRAY, La Salle county; J. T. LITTLE, Fulton county; WM. A. PENNELL, Putnam county.

I. There are now in the hands of the State of Illinois, $150,000 in money, and about sevety-two sections of land selected at an early period, and probably worth as much more.

II. The land and money was donated by the General Government to this State as a trust fund, apart from and independent of the Common School Fund.

III. With this fund the State is required by Congress to establish a STATE UNIVERSITY or High Seminary of learning.

IV. The members of this industrial league are such, and such only, of the inhabitants of the State of Illinois, as desire that when this State Seminary is established, it shall be upon the following rational and impartial principles:

V. It shall be designed to furnish to the great Industrial classes of the State, our Farmers, Merchants, and Mechanics, each in their own sphere, the same thorough, liberal, and practical education in those various sciences underlying their several pursuits, and in all processes, principles, and arts connected therewith, as our colleges and professional schools now afford to their students of theology, medicine, law, and the art of war; and shall be provided with all needful apparatus, lands, grounds, gardens, animals, drawings, mode s, instruments, and engines, for the proper elucidation of the same—as other schools are provided with their necessary apparatus.

To combine the friends of this interest, the INDUSTRIAL LEAGUE OF ILLINOIS was incorporated by the Legislature, February, 1853,

1st. With a capital of $20,000, to be raised by members' fees, and donations.

2d. With a board of one chief director and five associates, whose office it shall be

3d. To print and distribute books, pamphlets, and papers, explaining the advantages and necessity of this system of education.

4th. To employ lecturers to visit all parts of the State for the same purpose, and to appoint agents for making collections, &c.

5th. To circulate, and present to the Legislature and to Congress, petitions urging the adoption of this plan for a University, and the liberal endowment thereof by Congress lands, and by State funds in each State in the Union.

6th. To receive from each member ten cents admission, and ten

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cents annual subscription, with fee for diploma and such voluntary donations as may be contributed.

7th. The funds so collected to be applied to the payment of lecturers, agents, and officers, (other than associate directors, who shall receive no compensation for services,) to the payment of printing and such incidental expenses as shall be approved by the board; and on the establishment of a University, as herein contemplated, any surplus funds in the treasury to be paid over to the treasury of such University.

8th. Members of the Industrial League, who desire it, may withdraw from their membership upon giving notice to any agent of the board, provided their dues are all paid, including those for the year in which they withdraw.

9th. The year of the League commences with the first day of each January.

PLAN OF ACTION.

The report of the Granville Convention was designed as a mere outline or model, or idea of a perfect system of education, which the people of Illinois, and all States similarly situated, should bear in mind, and in all their efforts attempt to realize, as soon and as fast as should be found convenient and practicable. The Convention in express words invited their fellow-citizens to "contemplate this system as it will appear *when* GENERATIONS SHALL HAVE PERFECTED IT." How much, or what part of this scheme we should attempt first to execute, they did not deem it important to inquire.

Subsequent conventions, and the meetings under the Illinois Industrial League, have given it as their unanimous opinion, that we should at once make use of all our State funds derived from the general Government in precisely the way the wisdom of those statesmen who made the donation, and the existing laws of Congress require that they should be used, namely:

I. That the entir COMMON SCHOOL fund should remain forever sacred to the interests and direct uses of the common schools, as Congress designed.

II. That so much of the SEMINARY fund as is needed for that purpose should be immediately appropriated as designed, for the endowment of a seminary, or normal school, for the purpose of

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have conformed their systems to their own wants—and adapted to operate as the donors designed that it should, as the great, central moving power and balance-wheel of the whole system, giving us a complete and rational system of education, gathering around it the State pride and patriotism, and the devotion of the whole mass of the people, high and low, rich and poor. No little, one-horse system of mere naked, orphanized, and outcast common schools ever did, or ever can do: supplying its teachers, its lecturers, and diffusing its science, energy, enthsiasm, and power over all departments below.

Without these THREE DEPARTMENTS of public instruction, naturally sustaining and upholding each other, Congress was well aware, from all the experience of the past, as well as from the philosophy and very nature of things in the present, that any attempt to found an efficient system of common schools for the people in any State would prove a mere abortion, and hence they made a wise and liberal provision for each of those departments, which all experience had shown to be needful and indispensable.

The friends and members of the ILLINOIS INDUSTRIAL LEAGUE agree fully with their views, and would at once carry into execution their wise and patriotic designs.

As regards the departments most and first of all needed by our people in this State University, we believe they are as follows:

I. A NORMAL SCHOOL department, as above indicated.
II. A department of PRACTICAL AGRICULTURE.
III. A department of PRACTICAL MECHANICS.
IV. A COMMERCIAL DEPARTMENT.

The reasons for giving these departments the preference will be seen in the various preceding documents and papers:

They are in general—

I. Because the present funds are amply sufficient for such a beginning.

II. There are no such departments in any other institution in the State, and hence these would not conflict with any exisiting institution, but would tend to give new life and power to them all.

III. All our temporal and social interests, as well as the *spirit of the age*, demand such institutions, and all our people, wherever truly informed on the subject, feel that they need and want them.

IV. These four departments, founded together, would naturally sustain each other, and may now be rendered equally accessible

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V. The agricultural, mechanical, and normal school departments, MALE and FEMALE, are deemed now most needed, but other departments could be added, from time to time, such as the wants and the means of the State might require, until eventually a perfect system of UNIVERSAL EDUCATION, in the highest and truest sense, should become the pride and glory of our State, and the life and light of its entire system of popular public instruction.

The condition and character of our people is such, that no other system of general education can ever challenge the support of their hands and the devotion of their hearts, as all facts and experience, as well as all sound philosophy, show that this will.

Their universal, unanimous, and heartfelt approbation of this system, in all the cities, towns, and public meetings to which it has been presented, is in itself sufficient proof and guarantee of this fact. The things most needed to secure these ends are:

I. A speedy organization of all the industrial classes under the ILLINOIS INDUSTRIAL LEAGUE, chartered by the Legislature of Illinois, Feb. 1853, in order to give the people the same facilities of consultation and concert of action on this great interest, which they have sought for themselves by voluntary association in similar cases.

II. Petitions to our Legislature and to Congress, similar to those below.

III. Public meetings, discussions, and debates, in all our towns, precincts, and school-houses, of the merits and demerits of this system.

IV. A demand by the friends of the Institution from every candidate for any public office of a statement from him in writing whether he will use his influence for this system of Industrial Education, and if not, what system of popular education he will favor, if any, as this is the most important *measure* likely to come before the Legislature for years to come.

V. Let every Agricultural Society and every Mechanics' Institute, every State, and every neighborhood at once procure resolves of their corporations, or the signatures of their friends, and forward to Congress the following petition, or one of similar form, and adopt suitable petitions for and from their State Legislatures, and forward to the Chief Executor of the League a copy of the same.

PETITION TO CONGRESS.

The ——— would respectfully petition your honorable body for a grant of Congress

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FIFTH CONVENTION.

Pursuant to a call issued jointly by the Executive Committees of the State Agricultural and Horticultural Societies, a large number of Agriculturists, from all sections of the State, assembled in Bloomington, on Wednesday.

The Convention was organized at 2 P. M., at Phœnix Hall, James N. Brown, of Sangamon, being chosen President.

Messrs. S. B. Chandler, of St. Clair county, W. H. Van Epps, of Lee county, and Mr. Vansdell, of Union county, were chosen Vice-Presidents, and John P. Reynolds, Samuel Edwards and O. P. Galusha, Secretaries.

Capt. James N. Brown, as President, on taking his seat addressed the convention as follows:

GENTLEMEN—I scarcely know how to return my sincere thanks to this intelligent audience of my fellow-citizens, for the distinguished honor conferred upon me, by selecting so humble an individual as myself, to preside over a convention assembled to consider a subject of so vast and vital importance to the citizens of Illinois. The subject of education should be first in the heart of every American citizen, for upon the intelligence of the public mind is based our freedom. We have met for the purpose of interchanging views and sentiments in regard to the feasible steps to be taken to advance the industrial educational interest of our State; and I trust, that to day, a ball will be put in motion that will not rest till the object of the convention is nobly achieved. I hope to see inaugurated here, a system by which the practical benefits of thorough agricultural education may be secured for the home of every farmer in Illinois. We have a nucleus for such an object in the noble institution which the wisdom of our legislature has here founded; and I hope, and do not despair, to live to see the day when the State Normal University shall send her teachers to every common school in our State, to benefit our children with that education which brings an honest pride to the heart of the parent. I can say to the convention that their object has my best and warmest wishes, and shall have all of my humble influence in forwarding that which is fraught with so much interest to our children's children.

RESOLUTIONS PASSED.

WHEREAS, The true wealth and glory of all States depends upon the development of the real manhood of its citizens; and whereas, the great majority of the citizens of this State, are, and must ever be tillers of the soil, and the present means for the education of the children of our industrial classes, so as to best fit them for the duties of their several callings, and the still higher duties of American citizenship, are, at best, but very defective; therefore,

Resolved, That the time has now fully come for the endowment and organization of such additional institutions, departments, or courses of public instruction, as will more fully meet the wants of the industrial classes of the citizens of this State.

Resolved, That this convention hereby request the executive committees of our State Agricultural and Horticultural Societies to appoint a committee, whose duty it shall be—1st, to memorialize Congress to grant to each of the States of the Union such aid as was contemplated in the bill called the "Morrill Bill," which passed the House and Senate at a recent session; 2d, to memorialize and urge upon our State Legislature, to renew their petition to Congress, for the same substantial aid; 3d, to urge the establishment by the State Legislature of a school or department of agriculture, under the general direction of a board appointed conjointly by the same State Agricultural and Horticultural Societies for this purpose; 4th, to provide courses of lectures on agriculture and horticulture, similar to the course at the last session in Yale College, to be delivered at such times and places as they shall deem most fit, and to take all measures needful to secure these results.

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Resolved, That in our opinion a prominent place should be given to natural history and agricultural and industrial art in all our institutions of popular education, and especially in our normal and common schools; and that it should be the first care of the State, to raise up a corps of able teachers, competent to instruct in these departments in all our schools.

Resolved, That we rejoice in all efforts made in our State, in whatever quarter, to realize these results; and that we will encourage and aid all such efforts in any way which a wise use of our means will allow.

Resolved, That we especially approve of the efforts being made in our Colleges to meet this great want of the age.

Resolved, That this convention would respectfully recommend to the presidents and officers of our county and local agricultural, horticultural and mechanical associations, to call a meeting of their respective boards or societies to take into earnest consideration such measures as they may deem most expedient, and to co-operate with the State societies and with this convention for the attaining the above mentioned ends.

Resolved, That we recommend to the directors of each school district to call meetings in their several districts to discuss the subject of education, and to consider what further means of education they most need.

Resolved, That we recommend to all our fellow citizens in the selection of their candidates for public office and trust, ever to keep these interests properly in view.

EIGHTH CONVENTION.

PREAMBLE AND RESOLUTIONS UNANIMOUSLY ADOPTED AT A MEETING OF THE FARMERS AND MECHANICS OF ILLINOIS, HELD ON THE STATE FAIR GROUNDS IN DECATUR, SEPT. 15TH, 1864.

WHEREAS, The industrial interests are of paramount importance, all others being dependent upon their prosperity; and

WHEREAS, Congress has made a munificent grant of four hundred and eighty thousand acres of land, the proceeds of which are to be used for the endowment of an Industrial College for the promotion of Agriculture and the Mechanic Arts; and

WHEREAS, Certain existing institutions of learning have sought to divide this fund and partition the same among themselves; therefore,

Resolved, That we distinctly reiterate that the industrial interests of this State are one and indivisible; that the industrial classes are perfectly competent to draft a plan and arrange the details for the proper disbursement of this fund.

Resolved, That we endorse the sentiments contained in the resolutions of the Farmers' Conventions held at Springfield in June, 1863, and January, 1864, that there should be but ONE INSTITUTION created out of this fund, and that it should be entirely untrammeled by connection with any existing institution.

Resolved, That we, the industrial classes of Illinois, pledge ourselves to combine to use our utmost efforts for the advancement of our educational interests, and knowing, as we do, that these are the foundation upon which the permanent prosperity of the nation rests, we will continue to labor to devote this fund sacredly to the purpose for which it was intended, viz: "the establishment of one institution in this State in which the leading object shall be to teach such branches of learning as are related to agriculture and the mechanic arts.

Resolved, That as the aforesaid sciences are intimately connected with true progress in agriculture, it is of the utmost importance that this institution receive an endowment commensurate with the magnitude of the object in view.

Resolved, That seeing, feeling, and knowing the want of practical education in our several employments, we are determined to provide a better state of things for our posterity.

Resolved, That we will support no man for office, whatever his political associations may be, unless we have full assurance that he will labor to carry out our views in this matter, as herein expressed.

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Resolved, That we consider the present candidate for the office of Governor of this State as pledged in favor of nsing this fund as contemplated in these resolutions.

Resolved, That we refer "all whom it may concern" to the foregoing preamble and resolutions as embodying our "claim" in the premises.

Resolved, That we hereby appoint Wm. H. Van Epps, J. B. Turner, John P. Reynolds, A. B. McConnell, and B. G. Roots, whose duty it shall be to frame a bill, and urge its passage by the next General Assembly of this State, for the organization of an institution and disposition of the fund as contemplated by the act of Congress making the grant, and in accordance with these resolutions.

Resolved, That we request all the newspapers in this State to publish these resolutions.

CHAS. W. MURTFELDT, *Chairman*.

O. B. GALUSHA, *Sec'y*.

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ILLINOIS INDUSTRIAL UNIVERSITY.

REPORT OF THE COMMITTEE APPOINTED BY THE FARMERS' CONVENTION AT DECATUR, SEPT. 15, 1864.

To the Friends of Industrial Education in Illinois:

The undersigned, a committee appointed by the last of a series of mass conventions of farmers and mechanics, assembled during the State Fair at Decatur, in September, 1864, and specially charged with the duty of framing and urging the passage by the General Assembly of a bill for an act to organize, endow and maintain an institution of learning in this State, in accordance with the terms and provisions of an act of Congress, approved July 2d, 1862, donating lands to the several states for the benefit of Agriculture and the Mechanic Arts, feel that their duty to you demands of them a brief report of progress.

We accepted the trust with less reluctance than would otherwise have been felt, because, on all the main points and principles involved, the wishes of the great mass of our people, farmers, mechanics, and professional educators alike, as time and again expressed, were known to be in full harmony with the clear and explicit requirements of the fundamental act of Congress, both together forming a chart of instructions which could not be materially departed from by us unless willfully and without excuse.

That each of you may judge and decide for himself, we append to this report a copy of the act of Congress and of the matured bill which our friends in the General Assembly endeavored to pass; and also state some of the positions assumed by them and us in urging its passage:

I. The act of Congress contemplates a series of homogeneous institutions in the several states, *in every one of which* shall be taught the "branches of learning related to Agriculture and the Mechanic Arts," and "Military tactics," not excluding "other Scientific and Classical studies."

1. It was therefore insisted that any scheme which proposed to disrupt and dismember the institution, scattering its limbs hundreds of miles apart, would, if successful, violate the very law of its life, and, as an inevitable result, sooner or later produce its death.

2. It was also insisted that any scheme which provided MERELY for teaching *practical art*, either the art of Agriculture or the Mechanic Arts or trades, one or all of them, would, if successful, utterly fail to comply with the spirit or letter of the act of Congress, which provides that "*branches of learning related* to agriculture and the mechanic arts," (not agriculture and the mechanic arts themselves,) shall be taught; and thus recognizes the difference between a *work shop* or a *potato patch* and a *school of the highest possible grade*. While making ample provision for the physical labor of the pupil, as will be observed by reference to the 6th section of the bill, we did not deem it necessary, or best, or possible under the law, to organize a university for teaching exclusively, *practical art*, which every student may better and more profitably learn elsewhere, on the model farms, and in the model art departments which the Trustees were empowered to establish and conduct, or at home. While thus advocating the integrity of the institution itself, our friends no less strenuously urged:

II. The non-division of the fund and its appropriation to the endowment of a single University.

1. The bill is intended to become the organic act or charter of an institution to which, as its development progresses, under a wise administration of its affairs, all

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the people of the State may confidingly look as the great fountain head of popular instruction, the crowning glory of our common school system, and a source of just pride to every Illinoisan; whose pupils shall come from it living Americans, sound in mind, sound in body, and thoroughly skilled in the practical sciences which underlie the industries of life;—an institution soon to command the respect and cordial support of all, and become the favorite legatee of the wealthy men of the State. If, therefore, this conception, this necessity is to be realized (and anything else is unworthy of us) no meager sum will suffice to inaugurate it.

2. The amount to accrue from sale of the land scrip in possession of the State is uncertain. If the whole were sold at present market price, say seventy cents per acre, and invested in five per cent stocks, the annual income derived from it would be $16,800—a sum insufficient for the maintenance of any first class university with the addition of tuition fees; while it is hoped the trustees of this may be able, at an early day, to dispense with any considerable charge for instruction.

3. This is an experiment at best; but is fraught with interests of such magnitude and enduring importance, that no unnecessary risks should be assumed. If we can keep the people together and the fund together, we are thus, and only thus, sure of adequate moral and financial support.

III. Its location in such manner and form as a due regard to honesty and fair dealing with the people of the various localities desiring it seemed to require.

1. As an equivalent for the local benefits likely to flow from its being fixed at any point, the interests of the university demand, and the State is entitled to, not only a good bargain, but the best one obtainable; and that the greatest possible advantages, physical, financial, social and educational be secured.

2. If located in any manner which does not afford all portions of the State opportunity to make proposals, the sympathies and affections of the whole people cannot be expected to follow and bless it.

3. The precedents of this State were in favor of the intervention of a commission of discreet persons, to be selected by the Governor and Senate, or appointed by vote of both Houses of the General Assembly. There could be no appearance even of want of equity in submitting the matter to a commission; there were nearly two years and a half within which to secure the buildings, and our friends therefore adopted this mode.

On all minor points we were ready at all times to make concessions, but neither our friends in the general assembly, nor ourselves, were willing to yield up any of these self-evidently just principles.

Even before the first day of the session, the advocates of a division of this fund among several of the existing literary institutions commenced pressing their peculiar views upon the attention of members; but soon becoming aware that success was not possible, abandoned that movement as hopeless.

Immediately on the presentation of the bill by our friends in the House, a copy of it was obtained by those representing an interest in Champaign county, the eleventh section, which provided for a commission to locate, stricken out and a provision was inserted and introduced into the Senate locating the proposed university between the towns of Urbana and Champaign, on condition of the transfer for use of the university, of a certain edifice and grounds there situated.

For reasons at once apparent, our friends could not give this scheme their support. The point of location was not in itself objected to, but to locate direct by law without chance for competition would be a breach of faith to the remainder of the State, and sacrifice if not the life, at least the usefulness of the Institution. This claim was, however, most persistently pressed, and, during nearly the whole session, stood in the way of the passage of any other act upon the subject.

Near the close of the session, failing to bring the majority of both houses or of either house to the support of their plan, a combination was formed, and an amendment made to our bill in the House, providing for the location of the University proper in Champaign county, the creation of a school for the mechanic arts in Chicago, and a school for agriculture in Southern Illinois, dividing the fund among them in no very definite manner and thus practically dismembering the Institution itself.

Aside from the mere fact of division, this scheme was objectionable, because it provided for two schools of *practical art* only, a thing as already stated, not contemplated by the act of Congress. The bill, thus amended, passed the House, was sent to the Senate, and there sleeps, we trust in death.

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No law, whatever, on this subject was passed by the late General Assembly. The matter remains just as it was when your committee was appointed, except that the leading points and principles involved in it have been very generally and beneficially discussed. The enterprise was a new one; few members of the General Assembly had given it the study and thought its magnitude demanded before they could act intelligently upon it. Some of them, however, had, or at once comprehended it, in all its great and enduring relations to the educational, industrial and social interests of the State; and such battled manfully for the right. They are entitled to our lasting remembrance.

We do not care, in this report, to give the yeas and nays taken during the progress of the bills. Each constituency may ascertain for themselves how their immediate representatives voted; and if not in accordance with their views, the corrective is with themselves.

The bill we presented was, at one time or another, except the eleventh section, voted for and advocated by almost every member of both Houses; and, but for causes mentioned, would undoubtedly, have become a law without serious opposition.

Its most radical features—those which embody the greatest innovations upon the forms observed in the old established universities—meet the enthusiastic support of many of our most eminent practical educators. Further thought and discussion will suggest valuable amendments, so that the compulsory delay of two years will not be wholly lost. Two years, or ten years, are as nothing in the life of an institution such as this, compared with the importance of giving it a substantial basis and right direction. It is for you to see that your representatives, when next they are called to act upon the organization of the Illinois Industrial University, fully understand your wishes, and do them.

Respectfully,

WM. H. VAN EPPS,
J. B. TURNER,
A. B. McCONNELL,
B. G. ROOTS,
JOHN P. REYNOLDS.
} *Committee.*

February 16th, 1865.

THE AGRICULTURAL COLLEGE ACT.

AN ACT DONATING PUBLIC LANDS TO THE SEVERAL STATES AND TERRITORIES WHICH MAY PROVIDE COLLEGES FOR THE BENEFIT OF AGRICULTURE AND THE MECHANIC ARTS.

Be it enacted by the Senate and House of Representatives of the United States of America in Congress assembled, That there be granted to the several States, for the purpose hereinafter mentioned, an amount of public land, to be apportioned to each State in quantity equal to 30,000 acres for each Senator and Representative in Congress to which the States are respectively entitled by the apportionment under the census of 1860: *Provided*, That no mineral lands shall be selected or purchased under the provisions of this act.

SEC. 2. *And be it further enacted*, That the land aforesaid, after being surveyed, shall be apportioned to the several States in sections or sub-divisions of sections not less than one quarter of a section; and wherever there are public lands in a State, subject to sale at private entry, at one dollar and twenty-five cents per acre, the quantity to which said State shall be entitled, shall be selected from such lands, within the limits of such State; and the Secretary of the Interior is hereby directed to issue to each of the States, in which there is not the quantity of public lands subject to sale at private entry at one dollar and twenty-five cents per acre, to which said State may be entitled under the provisions of this act, land scrip to the amount in acres for the deficiency of its distributive share; said scrips to be sold by said States, and the proceeds thereof applied to the uses and purposes prescribed in this act, and for no other use or purpose whatsoever: *Provided*, That in no case, shall any State to which land scrip may thus be issued, be allowed to locate the same within the limits of any other State, or of any Territories of the United States; but their assignees may thus locate

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said land scrip upon any of the unappropriated lands of the United States subject to sale at private entry, at one dollar and twenty-five cents per acre: *And provided further*, That not more than one million acres shall be located by such assignees in any one of the States. *And provided further*, That no such locations shall be made before one year from the passage of this act.

SEC. 3. *And be it further enacted*, That all the expenses of management and superintendence and taxes from date of selection of said lands, previous to their sale, and all expenses incurred in the management and disbursement of the moneys which may be received therefrom, shall be paid by the States to which they may belong, out of the treasury of said States, so that the entire proceeds of the sale of said lands shall be applied, without any diminution whatever, to the purposes hereinafter mentioned.

SEC. 4. *And be it further enacted*, That all moneys derived from the sale of lands aforesaid, by the States to which the lands are appropriated, and from the sales of land scrip hereinbefore provided for, shall be invested in stocks of the United States, or of the States, or some other safe stocks, yielding not less than five per cent. upon the par value of said stocks; and that the money so invested shall constitute a perpetual fund, the capital of which shall remain forever undiminished, (except so far as may be provided in section fifth of this act,) and the interest of which shall be inviolably appropriated by each State, which may take and claim the benefit of this act, to the endowment, support and maintenance of, at least one college, where the leading object shall be, without excluding other scientific and classical studies, and including military tactics, to teach such branches of learning as are related to agriculture and the mechanic arts, in such manner as the legislatures of the States may respectively prescribe, in order to promote the liberal and practical education of the industrial classes in the several pursuits and professions in life.

SEC. 5. *And be it further enacted*, That the grant of land and scrip hereby authorized, shall be made on the following conditions, to which, as well as to the provisions hereinbefore contained, the previous assent of the several States shall be signified by legislative acts:

First: If any portion of the fund invested, as provided by the foregoing section, or any portion of the interest thereon, shall, by any action or contingency, be diminished or lost, it shall be replaced by the State to which it belongs, so that the capital of the fund shall remain forever undiminished; and the annual interest shall be regularly applied without diminution to the purposes mentioned in the fourth section of this act, except that a sum, not exceeding ten per centum upon the amount received by any State under the provisions of this act, may be expended for the purchase of lands for sites or experimental farms, whenever authorized by the respective legislatures of said States.

Second: No portion of said fund, nor the interest thereon, shall be applied, directly or indirectly, under any pretence whatever, to the purchase, erection, preservation or repair of any buildings.

Third: Any State which may take and claim the benefit of the provisions of this act shall provide, within five years, at least, not less than one college, as prescribed in the fourth section of this act, or the grant to such State shall cease; and said State shall be bound to pay the United States the amount received of any lands previously sold, and that the title to purchasers under the State shall be valid.

Fourth: An annual report shall be made regarding the progress of each college, recording any improvements and experiments made, with their costs and results, and such other matters, including State industrial and economical statistics, as may be supposed useful; one copy of which shall be transmitted by mail, free, by each, to all the other colleges which may be endowed under the provisions of this act, and also one copy to the Secretary of the Interior.

Fifth: When lands shall be selected from those which have been raised to double the minimum price, in consequence of railroad grants, they shall be computed to the State at the maximum price, and the number of acres proportionally diminished.

Sixth: No State, while in a condition of rebellion or insurrection against the government of the United States, shall be entitled to the benefits of this act.

Seventh: No State shall be entitled to the benefits of this act, unless it shall express its acceptance thereof by its Legislature within two years from the date of approval by the President.

SEC. 6. *And be it further enacted*, That land scrip issued under the provisions of this act, shall not be subject to location until after the first day of January, 1863.

SEC. 7. *And be it further enacted*, That land officers shall receive the same fee for

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locating land scrip issued under the provisions of this act, as is now allowed for the location of military bounty land warrants under existing laws: *Provided*, that maximum compen ation shall not be thereby increased.

SEC. 8. *And be it further enacted*, That the Governors of the several States to which scrip shall be issued under this act, shall be required to report annually to Congress all sales made of such scrip until the whole shall be disposed of, the amount received for the same, and what appropriation has been made of the proceeds.

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